



**Report on
PPG Industries
Nexus to Lower
Passaic River Study
Area**

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EXECUTIVE SUMMARY

INTRODUCTION

This report focuses on PPG Industries, Inc. operations at its former Newark, New Jersey coatings facility and possible influences and interactions with the Passaic River, specifically the Lower Passaic River Study Area Operable Unit of the Diamond Alkali Superfund Site.

The industrial complex at 29 Riverside Avenue, Newark, Essex County, New Jersey (the Riverside Industrial Park or RIP) has had a number of owners, leasees, and industrial operations since the beginning of the twentieth century. The initial use of the property was as a coatings facility (the Newark Coatings Facility or NCF) owned and operated by PPG Industries, Inc. or its predecessors (PPG). The property was reclaimed from the Passaic River with historical fill. The NCF began operations in 1902 and grew over time until it was closed early in 1971. In this report, the use of RIP refers to post-PPG ownership while NCF refers to when the facility was owned and operated by PPG. RIP is located at River Mile (RM) 6.8.

While subsequent uses during and after 1971 will not be fully enumerated in this report, some examples of post-PPG operations have been included to clarify materials brought on the property and potential contaminant contributions associated with those post-PPG owners and operators.

New Jersey Department of Environmental Protection (NJDEP) and United States Environmental Protection Agency (USEPA) have undertaken investigations and interim remedial actions at RIP. The most prominent Interim RA was their response to a 2009 oil spill and removal of wastes from Buildings 7 and 12. In addition, USEPA collected and analyzed container, soil, and sediment samples. Under NJDEP auspices, responsible parties have conducted investigations and in some cases performed remedial actions.

The RIP was designated the Riverside Industrial Park Superfund Site on May 24, 2013 when it was listed on the National Priorities List ("NPL"). PPG is only one of 18 parties associated with RIP that agreed to fund or perform the RI/FS (Administrative Settlement Agreement and Order on Consent [ASAOC], 2014).

PPG'S NCF OPERATIONS

The NCF manufactured paints, lacquer, enamels, varnishes, linseed oil, and resins, and the manufacturing processes and the raw materials used evolved throughout the period PPG owned and operated the NCF (1902-1971). There is no evidence of direct waste or hazardous substance discharges by PPG into the Passaic River from the NCF. Documented releases occurred to the Passaic River after 1971 with the most notable release being the 2009 "Mystery Oil Spill". During this release, contents were released from tanks located in the basement of Building 12 on the property into the river via underground pipes that appear to be installed after 1971.

Based upon PPG operations at NCF, the primary compounds used would be non-chlorinated solvents and oils. Organic solvents used would be mixtures of various natural hydrocarbons (e.g., linseed oil, turpentine), petroleum hydrocarbons (e.g., mineral spirits, naphtha) and specific solvents (e.g., xylenes, toluene). If any of these organic materials were present in the environment at the beginning of 1971 (when PPG ceased NCF operations) environmental processes would have been degrading them for a period of 45 years and some reduced fractional part of the compounds, if anything, may remain. Pigments containing metals (titanium and lead) were also used with the primary metals at the NCF.

NCF had no lagoons, ponds, landfills, disposal pits, dry wells, settling basins or other disposal units. The waste management practices employed by PPG generated wastes that were either reused in products or sent off-property for disposal. There are no surface water control measures (catch basins, storm sewer system) at RIP and

approximately 80 percent is paved. Overland flow toward the river occurs during precipitation events, but no erosion channels or ditches are present at RIP indicating overland flow causing soil erosion is minimal.

NCF was and RIP is connected to the PVSC sewer system. Prior to the Passaic Valley Sewerage Commission (PVSC) connection, NCF connected to the City of Newark sewer system. The NCF connections to the PVSC sewer system were constructed in a manner that prevents direct discharge of NCF waste water to the Passaic River even during high-flow condition. NCF waste water could not reach the PVSC chamber where the bypass flow to the river occurs.

PPG IS NOT ASSOCIATED WITH ANY OF THE REMEDIAL ACTION CONTAMINANTS OF CONCERN FOR THE LOWER PASSAIC RIVER

The key contaminants of concern (COCs) based upon the risks being addressed by the Lower Passaic River Study Area Record of Decision (ROD) are dioxins/furans, polychlorinated biphenyls (PCBs), mercury, dichlorodiphenyltrichloroethane (DDT), dichlorodiphenyldichloroethylene (DDE), and dichlorodiphenyldichloroethane (DDD) (DDx refers to the total of DDD, DDE, DDT in this report). None of the materials used by PPG at NCF were known to contain dioxins, furans, PCBs, or DDx. PPG's operations in Newark were limited to manufacturing paints, varnishes, and other coatings; chlorinated compounds were not manufactured at the NCF. In addition, there were no known processes where dioxins, furans, PCBs, or DDx would have been generated as by-products, as chlorinated materials were not used in coating manufacturing process at NCF. Mercury probably was used by PPG in trace amounts as a preservative in some paints, but there is no known release of mercury during PPG operations.

Even if there were discharges of hazardous substances during PPG's NCF operations, historical U.S. Army Corps of Engineers (USACE) and commercial dredging adjacent and downriver of RIP removed sediment until the late 1940s (barge berth) and 1950 (Kearny Reach navigation channel). It is projected that infilling of the PPG barge berth along the bulkhead would decrease over time as the depression filled in. Dredging would have removed hazardous substances in the dredged sediment.

Groundwater investigations conducted by responsible parties under NJDEP auspices documented contaminated groundwater associated with the responsible party operations or historical fill. None of the groundwater contaminants above USEPA or NJDEP standards are dioxins/furan, PCBs, DDx or mercury.

Dioxins/furans, mercury, and DDx, if detected in RIP soils, are below USEPA Regional Screening Levels (RSLs) and/or within the concentration range for sediments adjacent to RIP. Any PCB concentrations above screening levels are attributable to post-PPG operators at the RIP or historical fill. The highest soil 2,3,7,8-TCDD concentration at RIP is less than the average sediment 2,3,7,8-TCDD concentration adjacent to RIP indicating the NCF/RIP is not a source of dioxin, but its proximity to the river probably reflects residual sediment from past flooding events. The 2,3,7,8-TCDD/total TCDD ratio and congener fingerprint profile indicates that the source of the RIP soil dioxin is herbicide manufacturing and is consistent with the Lister Avenue site.

Polychlorinated dibenzodioxin/polychlorinated dibenzofuran (PCDD/F) data from sediment sample locations adjacent to RIP were evaluated to determine the 2,3,7,8-TCDD/total TCDD ratio and congener and homolog fingerprinting. Like the soil samples, these ratios and congener and homolog fingerprints support the finding that PCDD/F being reported in RIP-adjacent sediment can be attributable to PCDD/F discharges from the Lister Avenue site.

In addition, statistical analyses were completed to further evaluate any potential impact from the NCF/RIP to the Lower Passaic River sediments. The findings show that average and median shallow and deep sediment concentrations generally increase moving downriver within the river segments evaluated. Downriver sediment concentrations of 2,3,7,8-TCDD, total DDx, mercury, and total PCB aroclors are higher than sediments adjacent to the RIP or sediments upriver to the RIP. The sediment COC concentrations are lower in sediment adjacent to RIP, indicating that the RIP is not a source area for 2,3,7,8-TCDD, DDx, mercury, and PCBs.

The highest Cesium-137 (Cs-137) concentrations directly correspond to the highest 2,3,7,8-TCDD concentrations in sediment. This supports that the deposition of the most contaminated 2,3,7,8-TCDD in sediments adjacent to RIP occurred in the mid 1950s and 1960s (i.e., during the period of peak discharges from Lister Avenue).

Depending on location, sediments deposited adjacent to the RIP after 1971 (when the NCF operations ceased) range from 1.5 to 4.2 feet below the sediment surface. Any COCs in sediments deposited after 1971 would not be associated with PPG.

1. INTRODUCTION

This report focuses on PPG operations at its former Newark, New Jersey coatings facility (Figure 1-1) and possible influences and interactions with the Passaic River. The main components of the report are as follows:

- Property development and uses summary.
- An evaluation of raw material used and finished products made by PPG.
- Overview of PPG's waste management practices, and any spills/releases, fires or other environmental incidents, including on-property waste water management system(s) and connections to the City of Newark and Passaic Valley Sewerage Commission (PVSC) systems.
- Possible Newark Coatings Facility (NCF) / Riverside Industrial Park (RIP) interactions with the river including flooding, dredging, and discharges.
- Statistical evaluation of river sediment contaminants of concern (COC) concentrations in the vicinity of RIP (adjacent, upriver and downriver).
- Evaluation of the presence and use in soil and groundwater of key COCs at NCF for the Lower Passaic River Study Area as identified in the March 4, 2016 Record of Decision (ROD).

The 29 Riverside Avenue property is currently identified as the RIP. For the purposes of this report, the use of RIP refers to post-PPG ownership while NCF refers to when the facility was owned and operated by PPG.

RIP is located at Passaic River Mile (RM) 7.2 based upon the U.S. Army Corps of Engineers (USACE) or RM 6.8 based upon United States Environmental Protection Agency (USEPA) designation as presented in the 2014 Focused Feasibility Study (FFS) for the Lower Eight Miles of the Lower Passaic River (Louis Berger, 2014). Other than summarizing previous river dredging, RM 6.8 is used in this report as the river location of NCF/RIP. The Passaic River adjacent to the RIP is a tidal estuary.

The RIP was designated as the Riverside Industrial Park Superfund Site on May 24, 2013 when it was listed on the National Priorities List ("NPL"). By letter, dated April 18, 2013, USEPA notified PPG, as well as 17 additional parties currently or formerly owning and/or operating at one or more of the parcels comprising the RIP Superfund Site, that USEPA considered the letter recipients to be potentially liable under Section 107(a) of Comprehensive Environmental Response, Compensation & Liability Act of 1980 (CERCLA) for conditions at the RIP Superfund, which PPG is undertaking a remedial investigation/feasibility study (RI/FS) in accordance with an Administrative Settlement Agreement and Order on Consent (ASAOC, 2014).

The information presented in this report is based on consideration of the following:

- ROD and FFS for the Lower Passaic River Study Area
- PPG historical records and maps including PPG 104(e) responses
- Former PPG employee interviews concerning NCF operations
- Observations of RIP in 2015 and 2016 by Woodard & Curran
- New Jersey Department of Environmental Protection (NJDEP) correspondence, files, and reports
- USEPA correspondence, files, and reports
- Documents related to the RIP Superfund Site prepared by Woodard & Curran, USEPA, and others

- USACE, Passaic Valley Sewerage Commission, and City of Newark files
- Sediment and surface water results from the Lower Passaic River Study Area

Other documents, published articles, and records used are also noted in this report.

2. RIVERSIDE PROPERTY

2.1 1890s TO 1971 DEVELOPMENT

The filling to create the property began before 1892. An 1892 Sanborn Map indicates that the majority of the Riverside property was part of the Passaic River. Boating docks shown on the north and central portions of the RIP in 1892 also appear to be the result of reclaiming land from the Passaic River prior to 1892.

In 1902, Patton Paint Company started operations on Block 614, Lot 1. By 1909, the majority of the Riverside property had been created via backfilling the Passaic River and improvements included Patton Paint Company structures on current Lots 1, 60, 61, and 62, a hotel, and a boat club (Figure 2-1). Portions of the current RIP remained unreclaimed in 1909 (in the vicinity of current Lots 57 and 70). These lots were created (backfilled) by 1931 (Woodard & Curran, 2015). The 1931 Sanborn map Riverside property boundaries are consistent with the current configuration.

The origin of the fill material is unknown, but soil boring data from several NJDEP related investigations (NJDEP Case Numbers E88434; E20110199; E88483; E20080157; E98132; E89257; and E2000550) describe the presence of ash, cinders, and brick in the fill. River dredge spoils also could have been used for fill. The Riverside property is identified on NJDEP's historical fill map as having fill material (<http://www.nj.gov/dep/njgs/geodata/dqs04-7.htm>).

Patton Paint Company merged into the Paint and Varnish Division of Pittsburgh Plate Glass Company in 1920, which in April 1968 changed its name to PPG Industries, Inc. (PPG). By 1950, PPG had expanded its NCF operations to the majority of the property excluding some southern lots. After discontinuing all operations in April 1971, PPG sold the 7.6-acre Riverside property later that year.

2.2 1971 TO 2016 DEVELOPMENT AND OPERATIONS

After PPG's sale of the property in 1971, the Riverside property was subdivided into 15 parcels/lots (Lots 1, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, and 70) (Figure 2-2) and became known as the RIP. In the past 45 years, RIP was the home of a wide variety of industrial manufacturing operations conducted by a multitude of companies. For example, manufacturing and chemical handling operations after PPG's ownership and operation of the property included the following (Woodard & Curran, 2015):

- Frey Industries (Frey)/Jobar Packaging – Facility involved with the packaging, blending, repackaging, and distribution of chemicals including polyester resins, flammable liquids, corrosives, and poisons. Operated as a hazardous waste treatment, storage, and disposal (TSD) facility. NJDEP Case #237938.
- Baron Blakeslee Inc. (BBI)/Allied Signal/Honeywell – Warehousing, distribution, and chemical analysis of various chemical blends and wastes. Frey Industries did chemical blending and packaging for BBI. NJDEP Case #E88434.
- Samax Enterprises – Chemical manufacturing of deck strippers, deck wash, Marine-Safer Products (strippers, marine paint removers), restoration cleaners, lead paint removers, masonry cleaners, paint hardener, and various solvents such as acetone, kerosene, lacquer thinner, linseed oil, xylenes, methyl ethyl ketone (MEK), muriatic acid, paint thinners, and toluene. NJDEP Case #E20110199.
- HABA International, Inc. (HABA) / Division of Davion Inc. / Acupac Packaging, Inc. – Manufacturing of nail polish remover and other cosmetic and soap products. NJDEP Case #E88483.
- Roloc Film Processing – Manufacture of foils utilized in various commercial products. NJDEP Case #E20080157.

- Chemical Compounds, Inc./Celcor Associates LLC /Teluca – Manufacture of hair dyes, facial creams, and bleaches. NJDEP Case #E98132.
- Gloss Tex Industries, Inc. – Manufacture of nail enamel, lacquer, and related cosmetic products. NJDEP Case #E89257.
- Federal Refining Company (FRC) – Scrap metal recycler specializing in precious metal recovery. NJDEP Case #E2000550.
- Ardmore Inc. / Ardmore Chemical Company – Manufacture of soaps, detergents and consumer beauty products.

Post 1971 operations at RIP included the use and storage of petroleum-based materials as well as hazardous materials. Some of the raw materials and products are the same materials (i.e., acetone, kerosene, lacquer thinner, xylenes, paint thinners, and toluene) as used or made by PPG. Documented discharges from post-PPG operations to the Passaic River occurred in the following years (Woodard & Curran, 2015):

- 1990 - Ardmore Chemical
- 1992 - Chemical Compounds Inc. (two discharges)
- 1993 - Chemical Compounds Inc.
- 2009 - Mystery Oil Spill from Building 12

There have been allegations concerning the existence of a 100,000-gallon UST existing at RIP. There are no records or observations that a 100,000-gallon UST existed during PPG operations.

An early record (1980s) of a “100,000-gallon tank” is the Jobar application for a hazardous waste TSD facility at RIP (Appendix A). Based upon NJDEP and USEPA records, Jobar and then Frey used the Building 7 basement as an unpermitted solid waste management unit. NJDEP reports included in Appendix A state wastes from hoses were discharged into the basement, which may be the “100,000-gallon UST” referenced by others. The basement material (sludge and liquid) was removed and the basement cleaned by USEPA contractors in 2012-2013. In early 2016, the basements of Buildings 7 and 12 (and small connection tunnel) contained water, which is likely an accumulation of precipitation (leaking building roofs), and does not appear to reflect tidal influences.

During PPG’s operation, the varnish manufacturing process in Building 7 would have precluded the basement being used as a 100,000-gallon tank. Building 7 had heat applied to varnish pots on the ground floor. The Building 7 basement likely contained the heat source equipment for these varnish pots. Exhaust capture duct work associated with the varnish process vessels is still present. There also appears to have been a utility tunnel connecting Buildings 7 and 12, all of which precludes the basement being used as a tank. There is no documentation or observations that a 100,000-gallon tank existed in Building 7 (or elsewhere) during PPG operations.

Another claim is that the 100,000-gallon tank “did not have a bottom” (NJDEP, 1992). The Building 7 basement has concrete walls and a concrete floor based upon June 2015 observations by Woodard & Curran. The first floor was partially removed by USEPA contractors to access the basement. During removal of wastes from the basement, USEPA did not report that the basement did not have a bottom.

As of August 2016, current operations at RIP include:

- Warehousing/distribution
- Used tire accumulation warehouse

- Vehicle dismantling and recycling
- Construction equipment storage
- Chemical research, manufacturing, storage, repacking, and/or distribution

Based upon observations in 2015 and 2016, unauthorized disposal of surficial solid waste is widespread and frequent on the southern portion of RIP.

2.3 ADJOINING PROPERTIES

Adjoining properties to RIP are and have been occupied by a fuel oil distributor (north side of property) and a concrete manufacturing company (south side of property). The fuel oil distributor had documented discharges into the Passaic River in 1987, 1990, 1991, and 1999. Railroad tracks and Riverside Avenue form the western boundary. The Passaic River bulkhead forms the eastern boundary of RIP.

2.4 NJDEP AND USEPA ACTIVITIES AT RIP

NJDEP and USEPA have undertaken investigations and interim remedial actions at RIP. The most prominent Interim Remedial Action was the response to the 2009 oil spill (Section 5.2) and removal of wastes from Buildings 7 and 12. In addition, USEPA contractors collected and analyzed storage tank, container, soil and sediment samples. Under NJDEP auspices, responsible parties have conducted investigations and in some cases performed remedial actions. Relevant findings and results from agency activities are presented in this report.

3. PPG OPERATIONS

The NCF was operated into early 1971 by PPG to manufacture paints, lacquer, enamels, varnishes, linseed oil, and resins. Based upon available information, the processes used in each of those operations are summarized below.

Raw materials were brought onto the property primarily by rail, tanker truck, or trailer truck. Flax seed and coal (for power) were brought onto the property by barge until 1946. The majority of liquid raw materials were stored in above ground storage tanks (ASTs) with ASTs in two buildings (Buildings 4 and 15). Large exterior ASTs were located south of Building 12, north side of Building 7, adjacent to the Riverside Avenue vehicle entrance, with flax seed silos/grain elevators along the river next to the flax seed oil mill. Ten 10,000-gallon underground storage tanks (USTs) adjacent to Building 12 also stored non-chlorinated solvents.

The primary coating manufacturing operations took place in the following buildings:

- Building 2/3 - paint (early 1900s)
- Building 12 - paint
- Buildings 7 and 9 - varnish
- Building 10 - flax seed oil mill
- Building 14 - lacquer
- Building 17 - resin

PPG's NCF operations were gravity-based systems. Raw materials were stored on upper floors and piped to lower floors via gravity for mixing, thinning, and blending. Paint and resins vessels and vats were rinsed with caustics or non-chlorinated solvents to clean them. The resulting rinseate was reused typically in lesser quality coatings, recycled, or sent off site for disposal/treatment. For a period of time, non-chlorinated solvents were recovered in a small building between Buildings 12 and 17. This building is no longer present.

Despite that its operations occurred before environmental laws were enacted in the late 1970s, PPG took proactive steps to minimize the potential environmental consequences of its operations. For example, employees reported the NCF had "cement walls" around all the tanks to contain accidental spills. Residues generated when the tanks were cleaned were placed into 55-gallon drums and disposed of by a hauling service; the tanks themselves were cleaned manually and were not pumped out, and no tanker trucks were used in the cleaning process. Based on available information considered by Woodard & Curran which included historical maps, company records, and employee interviews, PPG did not store hazardous substances outdoors in a manner that would allow these substances to reach the environment.

Finished products were transported from the NCF by truck and rail primarily in drums and 5-gallon and smaller containers.

3.1 PAINT MANUFACTURING

The primary product produced at NCF were oil-based paints and enamels. Paints are primarily composed of binders (e.g., polymers, resins), solvents or diluents, primary pigments (e.g., fine organic or inorganic particles), extenders (e.g., clays, chalk, gypsum, anhydrite), and additives (e.g., catalysts, driers). A simplified version of the paint making process included resin preparation and filtering, grinding pigments and mixing with the resins, adding additional resins if needed, adding and/or adjusting solvents and driers, and including any other additives, quality control checks, and product packaging. The primary products made by PPG at NCF were oil-based coatings. Fifty years ago, essentially all paints were oil based (Paint Quality Institute, 2016). Water-based paints also known as latex or acrylic paints became commercially available in the 1950s (Wikipedia, 2016). No documentation on the manufacturing duration or

quantities of water-based coatings at NCF was found. Extensive process and equipment changes would be required at NCF to produce water-based coatings.

According to company history, dry pigments and mixing varnishes or oils were brought to the top floor and mixed to form a paste. The paste mixture was fed through chutes to grinding mills on the next floor. Batches would then be sent again via chutes to a lower floor where thinning oils and solvents were added in large processing tanks. Tinting was also typically done on this floor. The product was then fed via pipes to the filling department. The filled one- and five-gallon cans were transferred by conveyor for packing for shipment or storage. Some paint was placed into 55-gallon drums. The filling equipment along with other equipment were air pressure operated machines.

The raw materials known to have been used by PPG during the paint manufacturing process include: natural gums, natural resins, flax seeds, non-chlorinated solvents, pigments, caustic soda, dyes, alkyd resins, chromium, lead, titanium, zinc, lead carbonate, mercury, copper oxide, and cadmium. Solvents included water, toluene, xylene, ethylbenzene, linseed oil, MEK, naphtha, turpentine, and mineral spirits. Some of these solvents were also used in making resin, varnish, and lacquer.

The primary metal pigments used at NCF contained lead or titanium oxides. Cadmium (yellow color) and chromium (durability) were used in some paints. Mercury was probably used in certain paints as a preservative.

3.2 RESIN MANUFACTURING

Alkyd resin production occurred at the NCF in Building 17 from approximately the 1930s until 1969. The alkyd resins are polyesters derived as the reaction products of vegetable oil triglycerides, polyols (e.g., glycerol) and dibasic acids or their anhydrides (e.g., phthalic anhydride) (Lambourne and Strivens, 1987). At NCF, alkyd resins were produced from polyunsaturated fatty acids (i.e., vegetable oil, linseed oil) and polyols (i.e., glycerin). With heat, the process creates glyceride oil to which anhydride is added to increase the molecular weight. Synthetic phenolic resins were added as a secondary component for some coatings. Resins manufactured at NCF were then diluted with a non-chlorinated solvent and used in paint and varnish manufacturing. Phenolic resins were not made at the NCF, but rather purchased in solid flake form from a supplier.

3.3 VARNISH MANUFACTURING

In 1910, the original varnish building was constructed. In 1936, a new varnish building was constructed at the current Building 7 location. The new building was identified as Building 7 while the original Building 7 was subsequently identified as Building 7A. Building 7A has been torn down.

Like with the paint operation that occurred in other buildings at NCF, upper levels of the varnish building were used for mixing and preparing the varnish for heat treatment in the first floor pots. Varnish was made from drying oils/polymers (i.e., linseed oil) and non-chlorinated solvents. The primary non-chlorinated solvents were white spirits, mineral turpentine and kerosene with minor amounts occasionally of toluene, xylene, and naphtha. The turpentine was obtained from the distillation of natural resins like pine sap while the mineral spirits used were petroleum based. Over the years, alkyd resins mostly replaced drying oils in varnish at NCF.

3.4 LINSEED OIL MANUFACTURING

Linseed oil was manufactured from flax seed at NCF from 1923 to 1947. According to the company history, flax seed was unloaded from barges on the Passaic River into grain elevators/silos at the NCF. The typical primary steps were pressing the seed to release the oil, then refinement of the oil with caustic soda. The discontinued manufacturing of linseed oil coincides with the last known use of barges at NCF in 1946 (PPG, 104e response).

Due to its polymer-forming properties, linseed oil was used on its own or blended with other oils, resins, or solvents as a drying oil or as a pigment binder in oil paints. A drying oil is an oil that hardens to a tough, solid film after air exposure (oxidation). The oil hardens through a chemical reaction in which the components polymerize by the action of oxygen (not through the evaporation of water or other solvents like lacquer). Drying oils were a key component of oil-based paint and some varnishes at the NCF. In the coating industry, the use of linseed oil in paints has been replaced by alkyd resins and other binders over time.

3.5 LACQUER MANUFACTURING

Lacquer is a fairly broad term that primarily addresses finishes that dry by solvent evaporation. Lacquers are a subset of paints with a high solvent content. At NCF, lacquer was primarily a combination of nitrocellulose (a resin) and solvents (such as butyl acetate). Nitrocellulose-based lacquers were developed in the early 1920s, and extensively used in the automobile industry for 30 years. Small amounts of flake naphthalene were used in lacquer (PPG 104e response).

3.6 PPG CONSTITUENTS OF INTEREST

Based upon PPG operations at NCF, the primary possible constituents of interest (COI) would be non-chlorinated organic solvents and oils. In the early days of paint manufacturing, the organic solvents used would be mixtures of various natural hydrocarbons (linseed oil, turpentine) and petroleum hydrocarbons (mineral spirits, naphtha). Later solvents became more specific like xylene and toluene, but hydrocarbon mixtures (as opposed to chlorinated compounds) continued to be used.

The organic materials that PPG used could be degraded by a number of environmental processes including photolysis, chemical oxidation or reduction, biological oxidation or reduction, or some combination of these or other processes. If any of these organic materials were present in the environment at the beginning of 1971, the combination of environmental processes had been degrading them for a period of 45 years such that some reduced fractional part of the compounds may remain. The remaining fraction can be estimated if a half-life for the compound has been determined.

For example, if a compound had a half-life of one year, then one-half of the original amount would be present at the end of the year. The estimate for longer periods of time can be made by multiplying 0.5 by itself as many times as the number of half-lives that have passed. The estimated fraction remaining after a period of 45 years if the half-life were one year would be 0.000000000000028 (Table 3-1), which is an extremely small amount. The literature values for the anaerobic half-lives for toluene, xylene, and ethylbenzene are 0.577 year, 1 year, and 0.625 year, respectively (Howard et. al., 1991). The half-lives for other non-chlorinated solvents are in this general range or even shorter (MEK – half-life of 0.077 year, Howard et. al., 1991). The shorter half-lives would mean more half-lives were contained in the 45-year period and even smaller fractions might remain today. The biodegradation half-life of naphthalene varies based upon media and has been reported to be up to 4.6 years, but the half-life in sea water was reported at 0.8 day (Howard et. al, 1991; ATSDR, 2005). Another consideration is that the 45-year period is the shortest period of time, if additional time was added (going back to 1960 or 1900) more half-lives would have incurred and even smaller fractions might remain.

Pigments containing metals may also be possible COI. The primary metals used in pigments at the NCF were titanium and lead. Metals used in smaller quantities would include zinc, chromium, and cadmium and possibly mercury as a

preservative in some paints. The pigments when mixed with solvents, cure/solidify leaving a solid film. The solvents would be degraded via evaporation, oxidation or by a process described above. Once in film form, the mobility of these metals in the environment is greatly reduced. Their primary movement would be by physical movement of the film particles.

4. WASTE MANAGEMENT

NCF had no lagoons, ponds, landfill, disposal pits, dry wells, settling basins or other disposal units, and none were documented in the NJDEP case findings, USEPA hazard ranking documents (USEPA, 2012), historical records, or employee interviews.

4.1 SOLID WASTE

Wastes were reused in production or disposed of off property. In some cases, liquids (i.e., water-based paint wastes and other water-based liquids) were discharged to the PVSC sewer system. Off-specification products were reused in lesser quality coating products.

Tanks, mixing pots, and reaction vessels were rinsed with non-chlorinated solvents or caustic liquids. At times, manual scraping was employed to remove solid residue. The resulting solid waste material was placed in drums for offsite disposal. For a period of time, used solvent was recycled by a solvent recovery process.

There has been some suggestion in historical documents that, in 1963, a PPG spill or leak occurred and required a tanker truck to clean up or dispose of the materials. This suggestion has been dispelled by the Chief Chemist at the NCF, who stated that to his recollection no such event took place in the 36 years that he worked at the NCF. Another affidavit by the 1960s plant manager supports the Chief Chemist's recollection.

4.2 SEWER SYSTEM

The NCF was and RIP is connected to the PVSC system. Based upon Woodard & Curran observations (July and August 2016) of the RIP sewer system, there appears to be two waste water sewer systems. As described in Section 5.3, NCF was likely connected to the PVSC system in the 1920s when the main truck line was completed adjacent to NCF. Prior to NCF connection to the PVSC, the facility was connected to the local Newark sewer system (Section 5.3). The July 2016 observation and PVSC records indicate sewer connections from the NCF/RIP were to sewer pipes that are beneath Riverside Avenue (Section 5.3).

5. POTENTIAL PATHWAYS TO RIVER

An evaluation of possible pathways to the Passaic River is summarized below. This evaluation includes possible direct discharges of hazardous substances, indirect discharges and river influences (e.g. flooding, and dredging).

5.1 POTENTIAL PATHWAYS RELATED TO HAZARDOUS SUBSTANCES

There is no evidence of direct waste discharges by PPG into the Passaic River from the NCF. The manufacturing practices employed generated wastes that were either reused in products or sent off property for disposal. Some water-based wastes (i.e., caustic wash water) were discharged to the sewer system.

There were no major spills or releases at the NCF based upon employee statements and lack of any records of spills. Employees recalled that the company was very concerned about safety and that minor spills were cleaned up promptly and placed in 55-gallon drums for disposal off property.

The only significant incident mentioned by former employees was a resin building fire in 1969. According to former employees, the 1969 resin building fire did not result in resin material reaching the river. The resin material was confined to the building (which is consistent with the physical state of hot resins being viscous that when cooled quickly solidified).

There is no storm drainage system at RIP. There are no existing catch basins for storm water as any overland flow occurs based upon topography. Approximately 80 percent of ground surface is pavement or buildings (Figure 5-1). There are no ditches or drainage swales. The ground surface is relatively flat with a slight slope toward the river. No signs of erosion due to storm water were observed in 2015 and 2016. Flooding of RIP is addressed in Section 5.3.

Based upon buildings observed in June 2015 and July 2016, there are no floor drains on the ground floor except in Ardmore Chemical building (Building 14). Building 14 floor drains are connected to the PVSC system (Appendix B, Attachments 5, 10, and 11). During the remedial investigation/feasibility study (RI/FS) Work Plan development phase for the RIP Superfund Site, owners/tenants in June 2015 stated that there were no floor drains in their buildings. In 2015 and 2016, the Building 7 basement and floors of Buildings 12 and 15 could not be observed by Woodard & Curran because of safety concerns and access restrictions. However, USEPA's removal action notes related to the Building 7 basement did not report the presence of floor drains or sumps.

NJDEP reported in a 1992 memorandum (Appendix A) covering Frey's operations that Buildings 6, 7, 9, 12 and 15 had no floor drains. In summary, NJDEP, tenant/owner comments, and the June 2015 observations did not document floor drains except as noted above.

5.2 2009 MYSTERY OIL SPILL

In October 2009, NJDEP and USEPA responded to a reported oil spill into the Passaic River from RIP. The oily content of tanks in the basement of Building 12 were released into the Passaic River through an underground pipe. The tanks were connected to the underground pipes by a hose (USEPA, 2012).

Based on NJDEP and USEPA investigation during removal activities, contents of the two basement tanks appeared to have been intentionally set up to discharge into the sewer; when the valve was closed, the release to the Passaic River ceased. Using the Haz-Cat Chemical Identification System, the spilled material tested positive for chlorinated solvents (USEPA, 2012). Based upon Woodard & Curran July 2016 observations, the tanks in the basement of Building 12 were removed.

Two pipes are located near the northeast corner of Building 7. Unlike the pipes noted originally by PVSC (discussed below), these pipes are not in bulkhead wall cut outs. These pipes are in the top part of the wall where the wooded

bulkhead was removed. The pipes are approximately two feet below the wall top and are exposed with one to two feet of pipe clearly visible. Based upon June 2016 observations, one pipe has a polyvinyl chloride (PVC) plug and, based upon USEPA notes related to their actions in response to the 2009 oil spill, the plug was likely installed by USEPA.

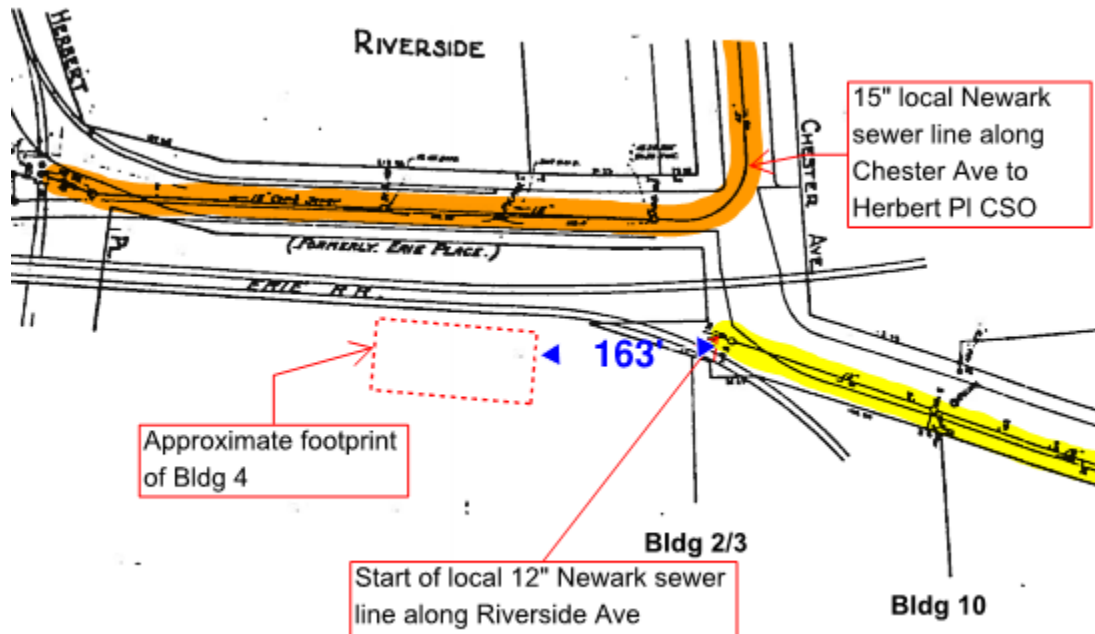
Based upon their location being close to the other pipes observed by PVSC, these pipes should have been observed by PVSC if they were present at the time of PPG's operations. Also, river bulkhead wall blueprints do not show cut outs for pipes or any pipes in the bulkhead (PPG, undated). Their different construction (bulkhead removed instead of through a cut out opening) and not being noted by PVSC suggests that these two pipes near the northeast corner of Building 7 were not present during PPG's ownership and operation of the NCF, but subsequently added after 1971.

5.3 INDIRECT AND OTHER PATHWAYS

5.3.1 Local Newark Sewer

When Patton Paints began operations in the early 1900s, there was a Newark installed sewer system in the Riverside Avenue area. Both the Herbert Place and Delavan Avenue sewers (Newark-owned sewers) were in existence when the PVSC trunk line was installed in the Riverside Avenue area in 1924.

As shown on a historical figure (Appendix B, Attachment 1), the Riverside Avenue area was connected to the local Newark sewer system which was operational as early as 1854 (Modica, 2007). Based upon a 1902 plumber specification document (Appendix C) for Building 4 (five-story manufacturing building), sewer piping is described as being connected to an existing sewer pipe. The specification lists the existing sewer system being 163 feet from the northwest building corner. This distance matches very closely to the beginning of the Delavan pipe connection on the PVSC drawing as show below:



As noted above, Building 4 is connected to the local Newark sewer. It is likely that other pre-1924 buildings would also connect to the local sewer system near the northwest corner of Building 2.

5.3.2 PVSC Sewers

In the 1920s, the PVSC system connected existing local municipal systems like Newark's Herbert Place and Delavan Avenue sewers to a main PVSC intercepting sewer. A 1923 Newark drawing shows the connections to be made to the existing local sewer system at Herbert Place (Appendix B, Attachments 2, 2a, and 4). A 1915 PVSC figure (Appendix B, Attachments 5 and 6) shows the Delavan Avenue connection.

Based upon PVSC records, the Newark sewer system was likely connected to the PVSC in the 1920s when the main intercepting sewer was completed in the area. A main intercepting sewer parallels the Riverside property under Riverside Avenue and in the adjacent railroad track right-of-way. 1915 PVSC construction drawings display the pipe at this location (Appendix B, Attachment 1a). A 1924 PVSC drawing states construction in the area of the NCF was completed in December 1924 (Appendix B, Attachment 2a). Existing manholes in Riverside Avenue and railroad right-of-way near the RIP align with the historical construction drawing layout.

There are two PVSC combined sewer outfall (CSO) pipes that run west to east beneath RIP to the south of Buildings 7 and 12. These pipes are identified by PVSC as the Herbert Place CSO.

Woodard & Curran has been unable to identify any NCF sewer waste water connection to the Herbert Place connector, which is expected as Chester Avenue homes and businesses west of RIP connect to the PVSC system at Herbert Place. Appendix B, Attachment 8/8a shows the local sewer system in the RIP vicinity. The local pipes leading to the Herbert Place connection are surface drains along the railroad tracks and are upslope from RIP based upon PVSC drawings. These local surface drainpipes connect to the CSO pipe and not the diversion chamber (Appendix B, Attachment 2a). Based upon these findings, the Herbert Place CSO did not accept waste water discharges from the NCF.

Major facility expansion occurred with six buildings constructed around the same time as the PVSC system became operational in 1924. The remaining buildings were constructed after 1931.

- Buildings #1, 2, 4, and 6 – present before 1909
- Building #2 – 1937 (apparent rebuild at same location)
- Building #3 – between 1909 and 1926
- Building #5 – between 1909 and 1926
- Building #7 – original 1910, rebuild 1936
- Building #7A – originally the 1910 Building 7
- Building #9 – 1919
- Building #10 – 1923
- Building #12 – 1925
- Building #13 – between 1926 and 1931
- Building #14 – 1930
- Building #15/15A – between 1926 and 1931
- Building #16 – between 1931 and 1950 (shed in 1931)
- Building #17 – between 1931 and 1942
- Building #19 – between 1950 and 1973

Based upon Woodard & Curran observations (July and August 2016) of the RIP sewer system, there appears to be two waste water sewer systems. Evaluations were made by observing manholes and reviewing historical sewer records. As detailed below, both systems discharge to the PVSC system.

One system is primarily for sanitary wastes (although current tenants also use it for their industrial waste water), and it is in active use on the north end of the property. This system has brick circular manholes with a flow groove in the

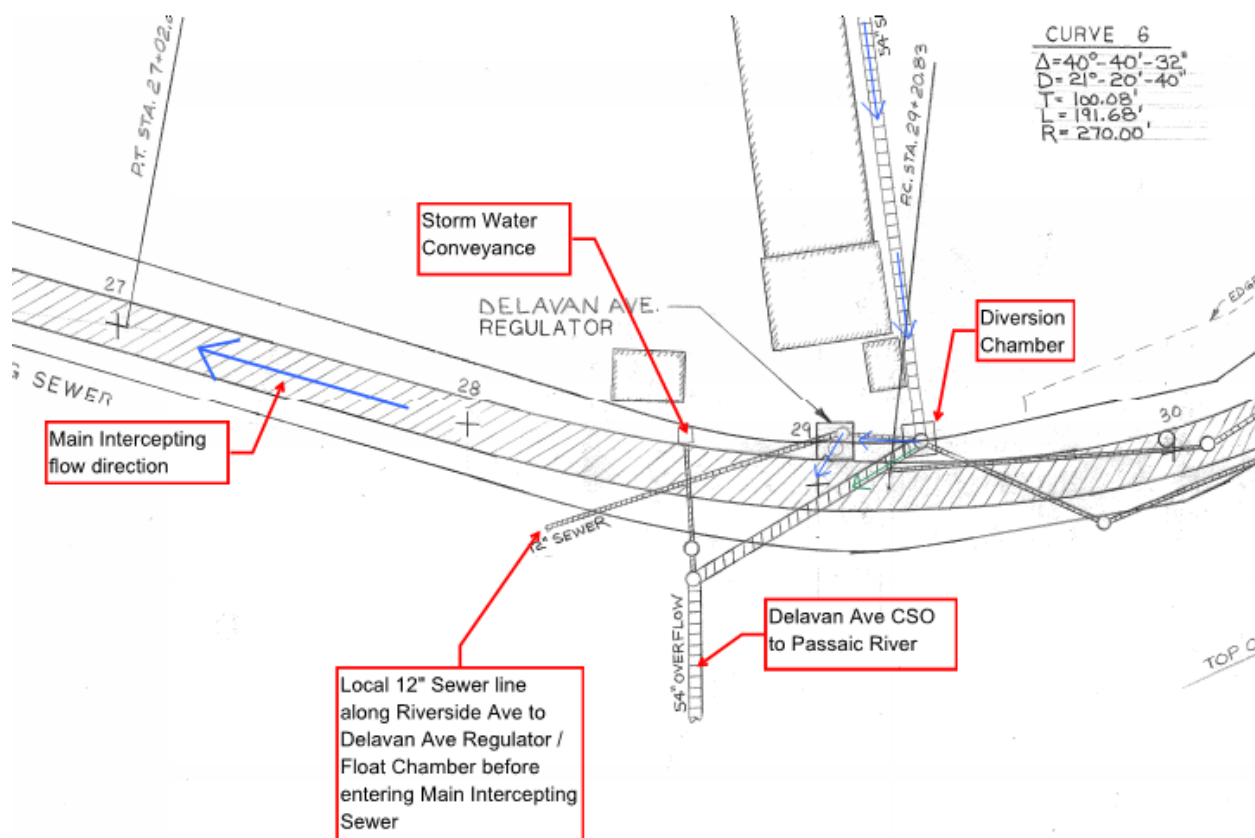
bottom. The second system is designated as the industrial waste water (IWW) system for this report and is comprised of non-circular concrete structures typically with several pipe openings. In July 2016, most IWW manholes were dry and inactive. A IWW manhole with standing water observed in 2016 is the inoperable pump station near Building 3. Based upon nearby manholes, waste water in Buildings 7 and 12 would have drained to this IWW manhole which connects to the sewer pipes in the basement of Buildings 2/3.

Both waste water systems discharge to a 12-inch diameter pipe beneath Riverside Avenue connecting to the Delavan Connector of the PVSC system. As shown on attached figures, there are two local collector sewers along the RIP property (Appendix B, Attachments 2, 2a, 5, 6). Both sewer lines originate near the Chester and Riverside Avenues intersection. The Chester Avenue sewer flows south to the Herbert Place connector while the Riverside Avenue sewer flows north to the Delavan Avenue connector via a 12-inch pipe. There is no evidence that NCF/RIP waste water is connected to Herbert Place sewer.

NCF/RIP are only connected to the Delavan Avenue connector (except for Building 17 during PPG operations, which was connected directly to the main PVSC truck line [as discussed below]). The Delavan connector (Appendix B, Attachment 7) has an inlet to the PVSC main intercepting sewer which flows south toward PVSC Newark Bay facility. PVSC Section 8N drawing (Appendix B, Attachment 2, 2a, and 3) also shows the beginning to the Riverside-Delavan pipe which originates between the railroad spur entering RIP and Building 2. This is the PVSC pipe which receives waste water from NCF and RIP.

The PVSC Delavan CSO schematic displays how the overflow works (Appendix B, Attachment 4). During low flow, liquids enter the primary or diversion chamber and are then diverted to the regulator chamber which has an outlet to the PVSC main intercepting pipe. During high flows, Delavan Avenue flow is diverted to the river from the diversion chamber.

Based upon PVSC Drawing Section 8N, the 12-inch pipe from NCF/RIP connects to the Delavan Avenue regulator chamber (Appendix B, Attachment 3/3a). The connection of the NCF/RIP sewer pipe to this chamber prevents NCF/RIP waste water from being discharged to the river during high flow or bypass events at the Delavan Avenue CSO connection. Instead, NCF/RIP waste water enters the regulator chamber and flows into the main PVSC intercepting sewer and to the PVSC treatment plant. During high-flow conditions, this waste water cannot reach the diversion chamber where the bypass flow to the river occurs. Below is a portion of the PVSC drawing showing the 12-inch sewer from RIP connected to the regulator chamber that is connected directly to the PVSC main intercepting sewer.



Appendix B, Attachments 10 and 11 show current sewers associated with Ardmore Chemical, which shows the same pipe connection beneath Riverside Avenue as during PPG operations.

As mentioned above, the only building not to discharge to the Delavan connector was Building 17. Based on a 1959 revision of a 1942 drawing, a sewer line from Building 17 existed going to the southwest presumably connecting to the PVSC main sewer line (PVSC connection is off map and not shown). In 1992, Chemical Compounds Inc. installed a sewer pipe to connect Building 17 to the main RIP sewer (Appendix B, Attachment 9). After 1992 Building 17 waste water was combined with wastes from the other RIP buildings and discharged to the PVSC system at the Delavan Avenue connector.

In summary:

- There is no evidence that NCF/RIP waste water discharged to the Herbert Place sewer at any time,
- With the exception of Building 17, NCF/RIP waste water was discharged to Delavan Avenue connector and those waste water discharges could not be diverted to Passaic River given the connection of the NCF/RIP piping to the Delavan Avenue regulator chamber (where no bypass option is available), and
- Building 17 discharged its waste water directly to the PVSC main truck line prior to 1992 and to the Delavan Avenue connector after 1992.

5.3.3 PVSC Noted Pipes

Several pipes are present in the river bulkhead wall adjacent to the former NCF. The pipes that come through the river bulkhead wall are consistent with the PPG era PVSC notes documenting pipes in the river wall (Appendix B, Attachment 12). Based upon these PVSC notes, the pipes are related to a water tank drain or compressor cooling water and not coating manufacturing. These pipes are approximately 3 feet below the river bulkhead top. Observations conducted in 2015 and 2016 noted that at least one pipe had vegetation growing out of it, and there were no visible liquids leaving the pipes. Although the PVSC notes are not dated, it is inferred that the observations were made in approximately 1970 as there is mention of PPG ceasing production. River bulkhead wall blueprints (Appendix C) do not show cut outs for pipes or any pipes in the bulkhead.

5.3.4 PPG Building Blue Prints and Construction Specifications

Woodard & Curran considered blueprints, construction specifications and other historical records concerning the construction and renovations of the PPG buildings. Only one set of blueprints show a possible connection to the Passaic River.

As noted in Section 3.3, Building 7 was rebuilt in 1936 at its current location which is adjacent and south of its original location. The original Building 7 was subsequently identified in PPG records as Building 7A. The 1910 Building 7 (Varnish Building) blueprints and specification indicate a 6-inch-deep concrete sink was to be installed. A pipe from the sink is installed to the river 50 feet away. Original Building 7 (a.k.a. Building 7A after 1936) has been demolished. No other information was located by Woodard & Curran on the existence or purpose of the sink. It is not known whether the sink and/or pipe to the river were ever constructed, especially since other portions of the original Varnish Building had "alternate" 1910 blueprint plans.

5.4 PASSAIC RIVER INFLUENCES

5.4.1 Flooding

The Passaic River has a history of flooding onto RIP. From the FEMA flood map (Panel 34013C0118F, 6/4/2007), the elevation of the 100-year flood at RIP is 9 feet mean sea level (MSL). From the topographic survey map of RIP (Figure 5-2), ground surface elevations range from approximately 6 to nearly 12 feet above MSL. It appears that 40 to 50 percent of RIP lies below elevation 9 MSL, including Buildings 6, 10, 13, 14, and 16, and portions of Buildings 1, 7, and 9. The top of the river bulkhead is between 6 and 7 feet MSL. This means water levels above 6 feet MSL would cause flooding at RIP.

There have been several specific accounts of flooding of the RIP including:

- In a letter to Lance Richman, USEPA, dated September 18, 1996 (Response to Question 10.a., TIERRA-B-004351), there was recollection by at least one PPG employee of flooding of the facility to an unknown extent in the 1960s.
- More recently, Chemical Compounds Inc. (occupant of Lots 62, 66, and 67) was named as the responsible party for six to eight empty drums that washed into the Passaic River during a storm event in August 1993 (NJDEP Case #93-8-17-1551-05).
- Additionally, flooding occurred from Hurricane Sandy in October 2012 based upon verbal reports from RIP tenants/owners at that time.

In addition to these accounts, there are river gauge readings that indicate flooding conditions at the RIP. The nearest U.S. Geological Survey (USGS) stream gauge station on the Passaic River (USGS Station 01392650) is approximately 6.5 miles downstream from RIP at the PVSC treatment plant at Newark Bay, where gauge elevations (gauge datum elevation is sea level) are available from March 2005 to present. Prior to March 2005, the gauge was located closer to

the RIP (approximately 2 miles downstream of RIP) and published as USGS Station 01392590 with peak streamflow and corresponding gauge elevations available from December 1992 to September 1999 and March 2001 to August 2003.

The nearest upstream gauge is behind Dundee Dam in Garfield City, New Jersey, where gauge elevations would not be representative of downstream river levels. Likewise, stream gauge readings on the Second, Third, and Saddle Rivers, although relatively close to the RIP, may not directly correlate to water levels in the Passaic River, and these gauge measurements were not evaluated.

The following gauge measurements correspond to overtopping of the bulkhead (i.e., gauge height above 6 feet):

- USGS Station 01392590
 - December 11, 1992 - 9.8 feet MSL
 - October 19, 1996 - 6.4 feet MSL
- USGS Station 01392650
 - March 13, 2010 - 6.47 feet MSL
 - August 28, 2011 - 7.21 feet MSL
 - October 29, 2012 - 12.13 feet MSL (Hurricane Sandy)

These dates correspond to the river overtopping the bulkhead. Based upon these stream gauge readings covering slightly over 20 years, it is expected that the Passaic River overtops the bulkhead to flood RIP approximately once every 4 to 5 years. Two 100-year floods at the RIP have occurred since 1992.

Flooding would have deposited river sediment along with erosion of RIP exposed surface soil. As mentioned previously, there are no surface water control measures at RIP and the majority of RIP is paved. Overland flow toward the river occurs during precipitation events, but no erosion channels or ditches are present at RIP indicating that overland flow causing soil erosion is minimal. As described in later sections, RIP soils have lower concentrations of the Lower Passaic River Study Area COCs than the river sediment, therefore, any erosion of RIP soil is not the source of the higher concentrations in the river sediments and might have diluted concentrations of Lower Passaic River Study Area COCs in sediment. In addition, river dredging (Section 5.4.3) occurred in the vicinity of RIP that would have removed sediment during PPG's operational years.

5.4.2 Residual Flooding Effects

As summarized in Section 7, there have been few exceedances of applicable USEPA Regional Screening Levels (RSLs) in RIP soil. There are low concentrations of PCBs, mercury, and DDx in soil. The source of these contaminants have been attributed to historical fill in some NJDEP cases. The low residual soil concentrations listed below also suggest that sediment deposited during Passaic River flood events may be a source of these impacts:

- PCBs - not detected to 33.5 milligrams per kilogram (mg/kg) (after Lot 70 remedial action)
- Mercury - not detected to 15.1 mg/kg
- DDx - not detected to 0.0075 mg/kg

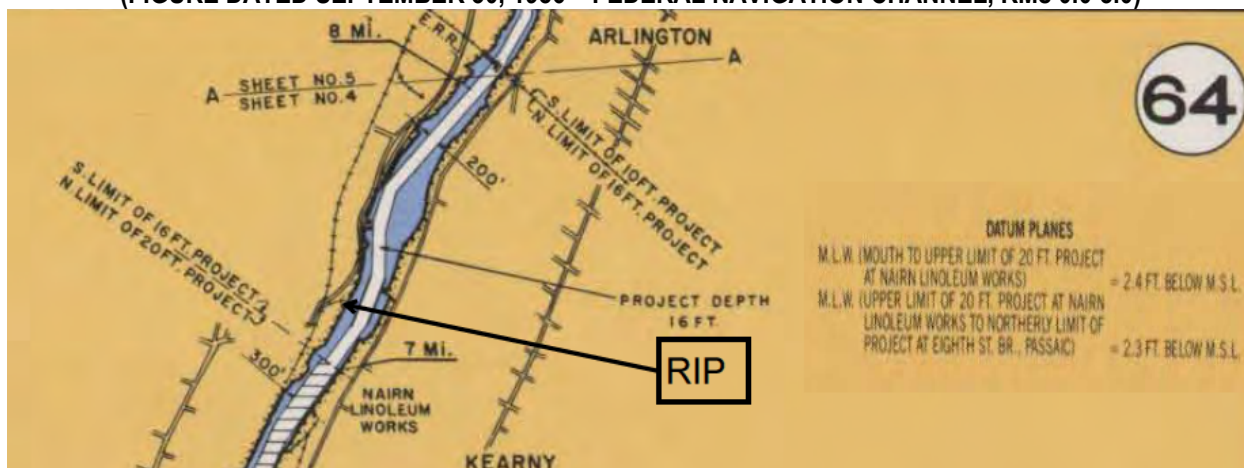
Importantly, these results are lower than the maximum river sediment concentrations adjacent to RIP (Section 8).

As summarized in Section 7.1, the highest RIP dioxin soil results (219 picogram/gram [pg/g] 2,3,7,8-TCDD) and the corresponding sample location and fingerprint suggest its source is sediment from river flooding.

5.4.3 USACE Dredging

As shown on Figure 1a from the *Lower Passaic River Commercial Navigation Analysis* (USACE, New York District, Revision 2, July 2010), the RIP is located at approximately RM 7.2 of the Passaic River federal navigation channel that begins at the confluence with Newark Bay.

EXCERPT OF FIGURE 1A – USACE JULY 2010
(FIGURE DATED SEPTEMBER 30, 1986 – FEDERAL NAVIGATION CHANNEL, RMs 0.0-8.0)



It is noted that the starting point for distance measurements to points upstream in the Passaic River used by the USACE (Junction Light in the Newark Bay Turning Basin) differs from that used for purposes of the FFS (Louis Berger, 2014). The FFS measurements begin approximately 0.25 mile further north in Newark Bay than the USACE measurements. Accordingly, RM measurements from the FFS and ROD will be approximately 0.25 mile less than those using the USACE starting point. As an example, RM 7.0 using the USACE starting point would correspond to approximately RM 6.75 using the FFS ROD starting point. Because the RIP is very close to the border between the Kearny Reach and Arlington Reach (as defined by the USACE as RM 7.2), there is a discrepancy between the FFS/ROD and USACE in the assignment of the appropriate reach (Arlington Reach) to the RIP.

From the USACE report (July 2010), the Lower Passaic River has been deepened between RM 0.0 and RM 15.4 (Wallington, New Jersey) as a result of several federally authorized projects to promote commercial navigation. Woodard & Curran focused on the Kearny and Arlington Reaches.

- Kearny Reach (RM 6.1 to 7.1) - Constructed to a 16-foot depth and 300-foot-wide navigation channel.
- Arlington Reach (RM 7.1 to RM 8.1) - The channel was constructed to a depth of 16 feet and is 200 feet wide.

The construction and maintenance of the Kearny and Arlington Reaches of the Lower Passaic River is summarized in the USACE report (July 2010) as follows:

Dredging History

Passaic River Reaches	Dredging History (USACE, 2010)
Kearny Reach: RM 6.1-7.1	1883 – Constructed to 6 Feet 1906 – Deepened to 12 Feet (to RM 6.5) 1906 – Deepened to 12 Feet (from RM 6.5) 1913 – Deepened to 16 Feet (to RM 5.8) 1916 – Maintained/Deepened at 16-17 Feet 1919 – Maintained at 16 Feet (to RM 6.4) 1933 – Maintained at 16 Feet (to RM 6.3) 1950 – Maintained at 16 Feet (to RM 7.0)
Arlington Reach: RM 7.1-8.1	1883 – Constructed to 6 Feet 1906 – Deepened to 10 Feet (to RM 8.0) 1915 – Constructed to 6-7 Feet (from RM 8.0) 1916 – Deepened to 16-17 Feet (to RM 8.0) 1927 – Maintained to 6 Feet (from RM 8.0) 1929 – Maintained to 6 Feet (from RM 8.0) 1930 – Constructed to 10 Feet (from RM 8.0)

The last dredging event for the Kearny Reach, immediately downstream of RIP, occurred in 1950. Furthermore, the above history indicates that the channel in the vicinity of RIP would have been dredged to a maximum depth of 16 feet in 1916, with no USACE dredging maintenance after 1916 near RIP. Post-1916 dredging in the Arlington Reach occurred at RM 8.0 and proceeded upriver into the Belleville Reach.

As previously mentioned, the Arlington Reach was federally authorized for a navigation width of 200 feet (USACE, July 2010). From aerial map measurement, the river spans approximately 430 feet in the RIP vicinity from bank to bank. The authorized navigational channel would be slightly less than half of the full channel width at this location, which appears to be generally consistent with Figure 1a from the USACE report (ASAOC, 2010).

In addition to the navigation channel, the USACE would dredge a transition zone. For a 16-foot dredging depth and 3H:1V transition slopes, the transition from the edge of the navigation channel to the flanks would extend 48 feet toward the RIP bulkhead, leaving a distance of 67 feet from the edge of the dredge channel to the RIP bulkhead.

Upon maintenance dredging stopping in 1950, infilling downriver from RIP would have occurred at higher sedimentation rates for these areas. Once these areas filled in, the sediment rates would decrease and become consistent with non-dredged area sedimentation rates (Louis Berger, 2014).

5.4.4 Barge Berth Dredging

The USACE dredging focuses on the navigational channel and transition zone. Barge access from the channel to dock would be the responsibility of each user. No records have been located on barge berth dredging near PPG's NCF operations.

Based on information provided in PPG's letter to Lance Richman, USEPA, dated September 18, 1996 (Response to Question 9, TIERRA-B-004351), there was a dock at NCF that was used for commercial activity:

"The dock was used in the first half of the century to unload flax seed and coal for use in the factory and to ship products. Based on discussions with former employees, the dock was not used after 1946."

Given the berth was used by PPG for commercial operations until 1946, it is reasonable to assume that dredging between the navigation channel and the bulkhead would have been undertaken, including maintenance dredging until 1946. Such dredging would have to extend for some distance upstream and downstream of the docking berth to allow

maneuvering of a commercial vessel. There are barge tie-downs on the RIP bulkhead where barges would be positioned for offloading. Sediment infilling of the barge berth would occur after maintenance dredging stopped.

Based upon 2015 soundings performed by USACE (Department of the Army, New York District Corps of Engineers, New York, New York, Operations Division, Survey Section CENAN-OP-S, Request No. 4400/N2/A, <http://www.nan.usace.army.mil/Missions/Navigation/Controlling-Depth-Reports/>) sediment deposition has filled in previously dredged areas between the navigation channel and the bulkhead.

5.4.5 Dredging Summary

RIP is located in the southern end of the Arlington Reach and immediately upriver from Kearny Reach. The southern RIP property line is very close to the dividing line between these reaches.

Sediment next to RIP and downriver would have been removed up until the late 1940s (barge berth) and 1950 (Kearny Reach navigation channel). It is projected that infilling of the PPG barge berth along the bulkhead would decrease over time as the depression filled in. Rapid sedimentation rates immediately after dredging followed by lower sedimentation rates are documented in the FFS, Report 3 (Louis Berger, 2014).

There could be more recent localized dredging for berths in these reaches by commercial facilities.

Historical USACE and commercial dredging adjacent and downriver of RIP removed sediment, and the dredging would have removed hazardous substances in the removed sediment.

6. PASSAIC RIVER COCS AND PPG OPERATIONS

The COCs identified by USEPA in the FFS ROD as presenting the greatest risk in the Lower Passaic River Study Area are polychlorinated dibenzo-p-dioxins and furans (dioxins and furans), PCBs, mercury, and dichlorodiphenyltrichloroethane (DDT) and its primary breakdown products, dichlorodiphenyldichloroethane (DDD) and dichlorodiphenyldichloroethylene (DDE) (<https://semspub.epa.gov/work/02/396055.pdf>). This section discusses data relevant to these compounds and PPG's NCF operations.

None of the materials used by PPG at NCF were known to contain dioxins, furans, PCBs, or DDx. PPG's operations in Newark were limited to manufacturing paints, varnishes, and other coatings; chlorinated compounds were not manufactured at the NCF. In addition, there were no known processes where dioxins, furans, PCBs, or DDx would have been generated as by-products. While parts of PPG's manufacturing process applied heat to various natural compounds, there were no reactions at high temperatures with chlorinated compounds. Any residues remaining from the heating processes were either reused or put in drums and disposed of off-site. The facility collected its non-chlorinated solvents and distilled them onsite for reuse. Any distillation residuals were drummed and removed by waste haulers.

There have been a series of speculative suggestions about PPG by other entities. Those entities have suggested that because PPG was listed nationally as a manufacturer or provider of various chlorinated compounds and that PPG had an operation on the Passaic River that the chlorinated compounds were manufactured or otherwise handled at NCF. This is an incorrect interpretation of the facts. PPG did not manufacture chlorinated compounds at NCF. PPG also did not use chlorinated compounds in its operations at NCF. PPG manufactured and handled chlorinated compounds at other locations in the United States, but not at the NCF.

6.1 DIOXINS AND FURANS

It has been suggested that phthalic anhydride used at NCF is a dioxin precursor. USEPA (1980) lists phthalic anhydride as a Class III compound, one which has the possibility but less likelihood of forming dioxin. USEPA also has indicated that Class III Compounds may require conditions such as an unusual combination of reaction steps to produce dioxins. Unchlorinated phthalic anhydride is widely used in a variety of industrial organic syntheses including paint, but in its chlorinated form, it is more often used as a compounding ingredient for plastics. No chlorinated phthalic anhydrides were used at the NCF based upon the information considered, nor would it be expected to be used in the production of coatings. There would have to have been a chlorine source present in PPG's operation to create chlorinated dioxins and/or furans from the phthalic anhydrides, but chlorinated compounds were not used in PPG's operations (Section 3).

The speculation that chlorinated dioxins would have been generated in the resin building fire at NCF would also have required a chlorine source. As described previously, PPG's resin-making process did not include chlorinated material. In addition, a PPG employee specifically sent to the NCF to investigate the explosion and fire which took place in 1969 recalled that most of the released material was confined inside the resin plant building itself. That employee stated that there was no evidence of any material flowing to the river from the resin building area, let alone any material spilling or discharging from the fire area.

It should be noted that in a list of Raw Materials and Wastes (Bates No. 853340010) that purports to list raw materials used in the manufacture of NCF products, the compounds *trans*-1,2-dichloroethene and chloroform are listed, and Exhibits 2 and 3 are listed as the purported source of that reference, but no mention of these compounds could be found in those exhibits. These compounds are the only chlorinated compound in the raw material list produced by Kroll Associates in 1994, and no other chlorinated solvents were identified in the material considered by Woodard & Curran.

6.2 PCBS

There is no documentation that PCBs were used as a component in any NCF produced coatings. As noted in Section 7.2, there are few exceedances of USEPA screening levels in soil that support information that PCBs were not a coating component. PCBs have been detected in soil by others as part of their NJDEP-related investigations at RIP. As noted earlier, RIP has been subjected to numerous Passaic River floods, which likely deposited PCB-contaminated sediments onto RIP. Some NJDEP-related investigations have also attributed PCB soil contamination to historical fill.

In the “Summary of Potential PCB Sources to PRSA (As of December 18, 2001)” submitted by Tierra Solutions Inc. on Page 6-B of Tab 71 for “PPG/Frey Industries,” there is a reference to P-5460 under “Other Aroclors”. It should be noted that Monsanto used the term Aroclor for some non-PCB products as well as its PCB products. P-5460 may have been misconstrued as a PCB because of Monsanto’s product nomenclature, but it is not a PCB. Tierra Solutions jointly references “PPG/Frey Industries”. It is unknown if Frey Industries managed PCBs but Frey did manage chlorinated compounds at RIP; PPG did not manage either chlorinated compounds or PCBs at the NCF.

6.3 DDX - DDT, DDD, AND DDE

No records considered indicate that DDx were used or generated by PPG, nor are they present in soils or groundwater at RIP above USEPA screening levels. Some DDx concentrations at RIP likely result from deposition of Passaic River sediments onto RIP as a result of flooding. Refer to Section 7.4 for discussion on pesticides/herbicides in RIP soils. The term DDx is used in this report to reflect these three pesticides.

6.4 MERCURY

Mercury in trace amounts was used by PPG probably as a preservative in some paints (PPG 104e response). There is no known release of mercury during PPG operations. See Section 7.3 for a discussion of mercury in RIP soils.

7. RIP SOIL AND GROUNDWATER DATA

Numerous NJDEP cases undertaken at RIP since 1985 have produced a significant amount of soil and groundwater data. The data are summarized in the USEPA approved Site Characterization Summary Report for the RIP Superfund Site. This section focuses on RIP soil results for the key contaminants associated with the Lower Passaic River Study Area (ROD, FFS Remedy).

Figure 7-1 displays the soil sample locations collected under NJDEP auspices and shows the widespread locations sampled at RIP. The soil concentrations of dioxins/furans, PCBs, mercury, and DDx were compared to current USEPA RSL for industrial soil (TR-10-6; THR - 0.1) (USEPA, 2016).

The use of RSLs at Superfund sites is to identify areas and contaminants that require further focus. Generally, at a site where contaminants are below RSL, no further action is warranted under the Superfund program (USEPA, 2016). As presented below, there are few RSL exceedances in RIP soil. The exceedances are within an order of magnitude of applicable RSL. The highest PCB exceedances noted below are related to the operations of others and not PPG.

7.1 DIOXINS AND FURANS

There were no NJDEP cases at RIP where samples were collected for dioxins and furan analyses. In 2011, a USEPA-retained contractor (Lockheed Martin) collected surface soil samples (zero to 1 inch) for dioxins and PCBs (Appendix D) “to support the Passaic River Site Investigation”. The soil samples were collected from the area north of Buildings 7 and 12 (Figure 7-2). Dioxins, if detected, were below USEPA’s RSLs. The highest concentration (dioxin TEQ – 234 pg/g) was in a sample (NS-11) along the river wall at an approximate elevation (8 MSL) that is a foot below the 100-year flood plain elevation (9 MSL). The 2,3,7,8- TCDD concentration was 216 pg/g (Table 7-1). The ratio of 2,3,7,8-TCDD to total TCDD was 0.7 (Table 7-1).

The soil dioxin concentration at RIP is less than the average sediment 2,3,7,8-TCDD concentration adjacent to RIP (Table 8-4) indicating this area is not a source of dioxin, but its proximity to the river probably reflects residual sediment from past flooding events. The 2,3,7,8-TCDD/total TCDD ratio indicates that the source of the RIP soil dioxin is herbicide manufacturing and is consistent with the 2,3,7,8-TCDD/total TCDD identified by others for a former manufacturing facility located at 80 and 120 Lister Avenue in Newark, New Jersey (near RM 3), which began producing DDT and other products in the 1940s (Quadrini, 2015).

Following the procedures described in Section 8.2.1, congener fingerprint profile was calculated for NS-11 dioxins/furans. The congener pattern is displayed on Figure 7-3, and it is consistent with the pattern reported by others for soil samples from the Lister Avenue site (Quadrini, 2015).

7.2 PCB

Figure 7-4 displays the soil samples collected for PCB analyses at RIP. Sixteen samples have concentrations exceeding a RSL. The highest concentration is 721 mg/kg for Aroclor 1254 and 411 mg/kg for Aroclor 1260, both located on Lot 70 (Figure 7-5).

Fourteen of the 16 PCB exceedances are associated with Building 16 on Lot 70 (Figure 7-5) and NJDEP Case #E2000550 (FRC). PPG used Building 16 as a maintenance shop, which did not involve the use of PCBs based upon documents considered. Beginning in 1985, FRC operated a scrap metal recycling process that used an incinerator with various acidic and caustic liquids on Lot 70/Building 16 (TRC,2015). Prior to initiating its operations and after the previous company (railroad ties and rails storage) vacated the property, FRC undertook an environmental assessment of Lot 70 which included the sampling and analyses of soil samples. Their findings reported that organic compounds were not detected other than trace concentrations of pesticides. PCBs were not detected in 1985.

In the early 2000s, FRC undertook an environmental assessment under Industrial Site Recovery Act (ISRA) Case Number E2000550. These findings indicated contaminated soil for metals and organic compounds including PCBs on Lot 70. FRC undertook a soil removal action to address the contaminated soil and implemented engineering and institutional controls to address the remaining contamination. In March 2012, contractors for FRC excavated soil containing PCBs greater than 50 mg/kg (TRC, 2015). Post-excavation soil samples are shown on Figure 7-6 that display the RIP PCB soil concentration above RSL after the soil removal action at Lot 70.

The remaining RIP soil sample (LD-1A) from an NJDEP case with a PCB concentration (1.7 mg/kg Aroclor 1254) above USEPA RSL was collected near Building 5 on Lot 64 (Figure 7-6). This PCB concentration is consistent with the PCB concentration USEPA reported in 2011 in that area (below) with the same Aroclor (1254).

Eleven surface soil samples were collected in 2011 by USEPA contractor (Lockheed Martin/SERAS) for PCBs (Appendix D). One sample (NS-1) contained PCB concentrations (Aroclor 1254) at 3 mg/kg above the USEPA selected screening level. This sample was collected from a soil pile where former Building 5 was located (Figure 7-2) and is located close to Sample LD-1A described above. In 1971 when PPG exited the property, Building 5 existed. Sometime after 1971 Building 5 was demolished and soil was subsequently stockpiled. The source of the stockpiled material is not known. Trees and other vegetation is growing in the pile based on observations in 2016.

Overall the PCB soil results and their locations confirm that the source of PCBs at RIP is post PPG. Other than Lot 70 PCB results which are associated with others, soil PCB concentrations are consistent with or less than the river PCB sediment concentration. The low PCB soil concentrations (other than on Lot 70) likely reflect residual contaminated sediment from past flooding events.

7.3 MERCURY

Figure 7-7 shows the locations of soil samples collected for mercury analyses under NJDEP auspices as well as samples with mercury concentrations above the USEPA industrial soil RSL (4.6 mg/kg). The soil mercury concentration range from not detected to 15.1 mg/kg (Figure 7-6). As listed in Section 8.2, mercury concentrations are higher in the river sediments both upriver and downriver of RIP than in the RIP soil.

7.4 PESTICIDES - DDX

For the soil samples collected and reported under various NJDEP cases, DDx was not reported in soil samples at concentrations above USEPA industrial soil RSL (Woodard & Curran, 2015). Figure 7-8 shows the locations of the samples collected for pesticides.

The soil individual DDx concentrations are also less than background concentrations listed in Table 26 of the March 2016 Decision Summary for the Lower 8.3 Miles of Lower Passaic River. There were no detections of DDE. This information, in combination with PPG operations not involving pesticides, indicate any pesticide concentrations are not related to PPG. The extremely low concentrations (or not detected) of pesticides indicate the RIP is not a source of DDx contaminated sediment in the Passaic River.

7.5 GROUNDWATER

Groundwater investigations have been conducted by responsible parties under NJDEP auspices. Permanent NJDEP permitted monitoring wells were installed and sampled as part of some of these investigations. The majority of groundwater samples were collected from the water bearing zone within the shallow fill material. The depth to groundwater is typically less than six feet below ground surface at the RIP. The groundwater results from these monitoring wells indicate that impacts above USEPA maximum contaminant levels (MCLs) and/or NJDEP Groundwater Quality Standards (NJGQS) are present for select metals, volatile organic compounds (VOCs), and one polycyclic aromatic hydrocarbon (PAH), as presented below:

- Arsenic, barium, beryllium, cadmium, chromium, iron, lead, magnesium, and sodium have been reported at concentrations that exceed their respective MCLs and/or NJGQS. Several of the applicable responsible parties have attributed these impacts to historic fill.
- Four VOCs (tetrachloroethylene [PCE], trichloroethene [TCE], *cis*-1,2-dichloroethene [DCE], and vinyl chloride) were detected in the area of Lot 68 that is related to a 1987 PCE spill. An NJDEP Classification Exception Area (CEA) with a Monitored Natural Attenuation remedy has been instituted by the responsible party for the area impacted by PCE, TCE, *cis*-1,2-DCE, and vinyl chloride. An asphalt cap has also been installed in this area as an NJDEP-approved engineering control.
- Benzene and methyl tert-butyl ether (MTBE) (Lot 1 only) have been detected at concentrations above the NJGQS. Lot 1 is being investigated by the responsible party.
- The responsible party for Lot 70 has instituted an NJDEP CEA for benzene and select metals (arsenic, barium, cadmium, lead, and zinc). An asphalt cap has also been installed at Lot 70 as an NJDEP-approved engineering control.
- One PAH, benzo(a)anthracene, exceeded its respective MCL. Like metals, the presence of this compound has been attributed to historic fill.
- Total VOC tentatively identified compounds (TICs) and base neutral (BN) TICs concentrations have exceeded the NJGQS on several of the lots.

As indicated by the above, none of the groundwater exceedances are for dioxins/furans, PCBs, mercury, or DDx.

7.6 SUMMARY

As presented above, the Lower Passaic River Study Area COCs if detected at RIP were typically at low concentrations and below RSLs. The highest PCB concentrations detected in RIP soil were addressed by the responsible party (not PPG) under NJDEP's program. Dioxins/furans, mercury, and DDx if detected in RIP soils are below RSLs and/or within the concentration range for sediments adjacent to RIP listed in Table 8-4. The soil concentration range is as follows:

- PCBs - not detected to 33.5 mg/kg (after Lot 70 remedial action); Aroclor 1254 RSL - 0.97 mg/kg; Aroclor 1260 RSL - 0.99 mg/kg; total PCBs RSL - 0.94 mg/kg
- Mercury - not detected to 15.1 mg/kg (RSL – 4.6 mg/kg)
- DDx - not detected to 0.0075 mg/kg (DDD RSL – 9.6 mg/kg, DDE RSL – 9.3 mg/kg, DDT RSL – 8.5 mg/kg)

The source of these contaminants has been attributed to historical fill in some NJDEP cases. The low and widespread residual concentrations also suggest another possible source of sediment deposited during Passaic River flood events. As noted above, these results are lower than the river sediment concentrations adjacent to RIP.

As summarized in Section 7.1, the highest dioxin soil results (219 pg/g 2,3,7,8-TCDD) and its location suggest its source is sediment from river flooding.

Groundwater investigations conducted by responsible parties under NJDEP auspices documented contaminated groundwater associated with the responsible party operations or historical fill. None of the groundwater contaminants above USEPA or NJDEP standards are dioxins/furan, PCBs, DDx or mercury.

8. PASSAIC RIVER DATA

An evaluation of sediment data from the Passaic River in the vicinity of the RIP was conducted. The data were obtained beginning in the 1990s by several organizations, 20 years after PPG terminated its NCF operations.

8.1 SEDIMENT RESULTS

A statistical evaluation of Lower Passaic River (river) sediment data was completed with the goal of assessing the concentrations of several constituents in sediment adjacent to the RIP relative to upriver and downriver concentrations. Historical sediment data from samples collected in the river from 1990-2013 were evaluated. The sediment samples are listed by river mile in Table 8-1, and their locations are shown on Figures 8-1 through 8-5. For the purposes of the analyses conducted, only sediment data between river miles noted below were analyzed. The objective of the evaluation is to determine if there are differences in concentrations between upriver and adjacent sediments to RIP, and adjacent and downriver sediments to RIP.

Sample results have undergone various levels of data validation and data qualification. With the exception of samples qualified as rejected ("R"-flagged), all U- (nondetect), J- (estimated), and otherwise qualified data were considered to be usable for purposes of this evaluation. Data listed as "rejected" were omitted from the data sets. In instances where both a primary and duplicate sample was collected at a sample location, results from only the primary sample were used in the analyses. Similarly, certain pesticide samples were observed to have been analyzed as split samples at two different laboratories. In such cases, the results analyzed by the more sensitive method (those with lower reporting limits) were retained.

The data were segregated based upon location with respect to RIP, which begins at RM 6.8. For a comparison of sediment characteristics, the Lower Passaic River was divided into three segments as follows:

- Upriver from RIP – RM 7.05 to 8.05 (Figures 8-1 and 8-2)
- RIP adjacent – RM 6.80 to 7.05 (Figure 8-3)
- Downriver from RIP – RM 5.8 to 6.80 (Figures 8-4 and 8-5)

Samples are assigned to a segment based upon river mile in the data set. The sediment results were further divided into two-depth intervals; 0 to 2.5 feet and 2.5 to 6.0 feet. Sediment samples deeper than 6 feet were too few in number to provide reliable statistical analyses.

The sediment results were evaluated via two statistical processes. The first process developed a summary of the number of samples and non-detects by parameter, minimum and maximum concentrations (Tables 8-2 and 8-3). Average COC concentrations were calculated for each river segment (Table 8-4).

The statistical analyses were completed using ProUCL Version 5.1.002, USEPA's Technical Support Center for Monitoring and Site Characterization statistical program (EPA/600/R-07/038, *ProUCL Version 5.1.002 User Guide*). The data were downloaded from the database into either Microsoft® Access® or Excel® for initial processing, reformatting, and quality assurance checks as described above, and then further analyses were completed in ProUCL. Additional summary statistics calculations were supplemented by using JMP® Version 8.0.2 (JMP), a commercially available statistical package by SAS Institute, Inc. ProUCL does not have a function to calculate the median using the

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Kaplan-Meier (KM) method, so median concentrations were calculated using the survival statistics platform in JMP® Version 8.0.2 as well as Practical Stats, KM Stats Version 1.6®. Other assumptions for ProUCL analyses are listed in Appendix E along with statistical analyses output.

The COCs identified by USEPA in the FFS and ROD as presenting the greatest risk in the Lower Passaic River Study Area are dioxins and furans, PCBs, mercury, and DDx. For dioxins and furans, the most toxic dioxin or furan is 2,3,7,8-TCDD, and hence, the statistical evaluation was limited to that congener. To simplify the analysis, total PCBs and total DDx were evaluated. If total analytical results for these constituents were not available from the laboratory, the individual aroclors or DDx pesticide analytical results were summed to obtain a “total” result. In cases where the evaluated constituent or constituent group (for total PCBs and DDx) was non-detect in a particular sample, the highest reporting limit for that analyte or group of analytes was used as the concentration for the purpose of these statistics.

The ProUCL results and conclusions relative to the evaluated constituents are presented on Tables 8-5 and 8-6. Note that the summaries provided below focus on the inferential statistics and the calculated median concentrations provided on these tables. For non-normal (or “skewed”) data such as these, the median is a better indicator of the central tendency of the data versus the arithmetic mean concentration.

Fewer deep sediment sample results were available than shallow results, therefore, some of the deep data sets do not meet ideal sample size requirements. As presented in Table 8-6, the reliability of these tests is lower, and the results should be viewed as preliminary.

As shown on Figure 8-3, the sediment samples in the RIP adjacent segment are from the “mud flat sediment” next to the RIP bulkhead. Many of these sediment locations are near the 2009 spill pipes (Section 5.2) and PVSC observed pipes (Section 5.3.3). These locations and other locations next to the RIP river bulkhead would be expected to have elevated concentrations if a release of COCs to the river occurred at RIP. As described below, the sediment COC concentrations are lower in sediment adjacent to RIP when compared to downriver concentrations, indicating that the RIP is not a source area. Overall median and average shallow sediment concentrations generally increase moving downriver. Deep sediment average and median concentrations of 2,3,7,8-TCDD, the total DDx, mercury, and total PCBs are higher in downriver sediments than in sediments adjacent to the RIP. These findings provide another line of evidence that NCF did not contribute COCs to the Passaic River.

8.1.1 2,3,7,8-TCDD

Average and median 2,3,7,8-TCDD concentrations in shallow and deep sediment downriver are higher than the average and median 2,3,7,8-TCDD concentrations in sediment in the RIP adjacent and upriver segments. The highest 2,3,7,8-TCDD concentrations are located in the downriver shallow and deep sediment.

ProUCL statistical findings are downriver shallow sediment 2,3,7,8-TCDD concentrations are higher than in the upriver segments (Table 8-5). RIP adjacent shallow sediment concentrations are statistically similar to the other segments. For deep sediment, the statistical findings for the comparison of concentrations between segments are considered unreliable based upon the low number of samples (Table 8-6).

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8.1.2 Total PCBs

Average and median total PCB concentrations in shallow and deep sediment downriver are higher than the average and median total PCB concentrations in sediment in the RIP adjacent and upriver segments (Tables 8-4, 8-5 and 8-6). The median total PCB concentrations are higher in the shallow sediment when compared to deep sediment concentration in each segment. The highest total PCB concentrations are located in the downriver shallow and deep sediment.

Statistically, total PCB concentrations in downriver shallow sediment are higher than in the RIP adjacent and upriver segments. For deep sediment, the statistical findings for the comparison of concentrations between segments are considered unreliable based upon the low number of samples.

8.1.3 Total DDx

Average and median total DDx concentrations in downriver shallow and deep sediment are the highest among the three segments (Tables 8-4, 8-5 and 8-6). The highest total DDx concentrations are located in the downriver shallow and deep sediment.

The ProUCL findings are total DDx concentrations in downriver shallow sediment are higher than in the RIP adjacent and upriver sediment.

For deep sediment, the ProUCL statistical findings are considered unreliable based upon the low number of samples.

8.1.4 Mercury

The average and median mercury concentrations are basically the same in the RIP adjacent and downriver segments with the average downriver concentration slightly higher. Among all three segments, the average mercury concentration is similar with the highest average concentration located in the upriver segment. In shallow sediment, the highest mercury concentration was located in the upriver sediment. The highest deep sediment mercury concentration is located in the downriver segment.

The ProUCL findings are mercury concentrations in downriver shallow sediment are higher than in the upriver shallow sediment. Statistically, RIP adjacent shallow sediment mercury concentrations are similar to upriver and downriver sediment concentrations. The deep sediment findings are considered unreliable based upon the low number of samples (Table 8-6).

Eight of the 11 mercury concentrations that exceed the average and/or median mercury concentration in the shallow sediment are from a depth of less than 1.5 feet. Because of the limited number of samples in the RIP adjacent segment, these samples influence the shallow sediment median and average concentrations noted in Tables 8-4 and 8-5. As noted in Section 8.4, these samples collected above 1.5 feet represent sediment deposited after NCF operations such that the presence of mercury at these locations and depths is not attributable to PPG.

8.1.5 Sediment Results Findings

Median shallow sediment concentrations generally increase moving downriver from upriver to downriver. Downriver median concentrations of 2,3,7,8-TCDD, the total DDx, mercury, and total PCB aroclors are higher in downriver sediments than in sediments adjacent to the RIP or upriver. For all four evaluated constituents/groups, 2,3,7,8-TCDD, total DDx, total PCBs, and mercury, shallow sediment results adjacent to the RIP were statistically consistent with those found upriver. More significant differences were observed between upriver and downriver and adjacent to the RIP and downriver comparisons, with downriver concentrations typically being higher than either RIP adjacent or

upriver concentrations. Overall, the pattern of results from the deep sediment comparisons are broadly comparable to the shallow sediment concentrations with the highest median COC concentrations being downriver.

The finding that sediments adjacent to RIP have lower COC concentrations than downriver sediments provides an additional line of evidence that NCF did not contribute COCs to the Passaic River.

8.2 PCDD/F FINGER PRINTING

PCDD/F data were selected from nine sediment sample locations adjacent to or slightly downriver from RIP for congener and homolog fingerprinting. The ratios of 2,3,7,8-TCDD to total TCDD, along with congener and homolog analyses, have been utilized by several investigators as a fingerprint to identify a TCDD source site (Quadrini, 2015; Chaky 2003). The samples selected had the highest 2,3,7,8-TCDD concentrations in sediment samples adjacent to RIP and sediment samples evaluated for sedimentation patterns (Section 8.3).

Data were analyzed using methodology and interpretations consistent to those presented in the article “Fingerprinting 2,3,7,8-Tetrachlorodibenzodioxin Contamination within the Lower Passaic River” published in the *Environmental Chemistry* journal in February 2015 (Quadrini, 2015). The results of this analysis have been compared directly to fingerprints developed for the Lister Avenue site (Quadrini, 2015) for the purpose of evaluating source of PCDD/F contamination.

8.2.1 Methodology

PCDD/F data were selected from sediment core sample intervals at Locations 10A, 75A, 76, 276, 277, 278, HP3, and LPRC07B. The sample interval with the highest 2,3,7,8-TCDD was retained for analysis.

Bias-corrected data were not used for the analysis to ensure consistency across all data sets. This approach was also used in the Quadrini article as it was noted that bias correction factors did not have an impact on the results of fingerprint analysis. Also, consistent with the Quadrini article, analytes that were reported below the detection limit were set to zero prior to analysis. During data review, it was noted that the results for total tetra-furans at Sample Location HP3-TS1 was not available in the project database and a value of zero was assigned to this homolog.

First, the ratio of 2,3,7,8-TCDD to total tetra-dioxins was calculated for each location. Second, PCDD/F congener weight ratios were calculated and plotted for each sample interval. Consistent with the Quadrini article, 1,2,3,4,6,7,8-heptachlorodibenzodioxin (HpCDD) and octachlorodibenzo-p-dioxin (OCDD) were excluded from the analysis because of their ubiquity in the regional environment. The other 15 congeners (2,3,7,8-TCDD; 1,2,3,7,8-PeCDD; 1,2,3,4,7,8-HxCDD; 1,2,3,6,7,8-HxCDD; 1,2,3,7,8,9-HxCDD; 2,3,7,8-TCDF; 1,2,3,7,8-PeCDF; 2,3,4,7,8-PeCDF; 1,2,3,4,7,8-HxCDF; 1,2,3,6,7,8-HxCDF; 1,2,3,7,8,9-HxCDF; 2,3,4,6,7,8-HxCDF; 1,2,3,4,6,7,8-Heptachlorodibenzofuran [HpCDF]; 1,2,3,4,7,8-HpCDF; and octachlorodibenzofuran [OCDF]) were retained for the analysis and plotted on a weight percentage basis. Third, PCDD/F homolog weight ratios including total tetra-dioxins, total penta-dioxins, total hexa-dioxins, total tetra-furans, total penta-furans, total hexa-furans, total hepta-furans, and OCDF were calculated and plotted for each interval.

Average congener/homolog fingerprint profiles were calculated from the arithmetic mean of weight percentages for each sample interval. Error bars represent the range of weight percentages for each class.

8.2.2 Findings

The 2,3,7,8-TCDD to total tetra-dioxins ratio at each sample interval is greater than 0.6 (average of 0.85). Ratios of 0.6 and above in Lower Passaic River sediment samples have been associated with the Lister Avenue site (Quadrini, 2015; Chaky 2003). Ratios above 0.6 are also associated with the herbicide manufacturing of 2,4,5-trichlorophenoxyacetic acid (2,4,5-T), which was conducted at the Lister Avenue site (Chaky, 2003). As listed in

the Lower Passaic River Study Area FFS, the 2,3,7,8-TCDD to total tetra-dioxins ratio for urban runoff and sewage discharge is less than 0.1, and typically in the 0.04 to 0.06 range (Louis Berger, 2014).

Congener fingerprints for this analysis were compared directly to profiles for samples at/adjacent to the Lister Avenue site and sediments throughout the Lower Passaic River presented in the Quadrini article. The average congener fingerprint (Table 8-7) was found to be very similar to the fingerprint plots developed for samples at/adjacent to the Lister Avenue site and RM 0-8 (Quadrini article). The similarity is to be expected since the RIP is located at RM 6.8 upstream of the Lister Avenue site (RM 3), and Lister Avenue site impacts have been found to reach as far upstream as RM 14 (Israelsson, 2013).

As discussed in the Quadrini article, congener fingerprints dominated by 2,3,7,8-TCDD; OCDF; and 1,2,3,4,6,7,8-HpCDF are predominantly related to the Lister Avenue site source. The homolog profile for the RIP sediments (Table 8-7) is very similar to the Lister Avenue site fingerprint.

These ratios and congener and homolog fingerprints support the finding that PCDD/F being reported in the sediment near RIP is attributable to PCDD/F discharges from the Lister Avenue site.

8.3 SEDIMENTATION PATTERNS

Many investigators have used radiodating processes for developing sedimentation patterns in the Lower Passaic River (Erikson, 2007; Huntley, 1995). In 1991 and 1995, sediment core samples were collected at four locations adjacent to the RIP (Figure 8-6) as follows:

- 10A – Along bulkhead, adjacent to Building 6 (barge area)
- 75A – Next to 10A, toward navigation channel
- 76A – Along bulkhead, adjacent to Building 7
- 90A – Along bulkhead, adjacent to Building 17

The samples were analyzed for Cesium-137 (Cs-137). The primary source of Cs-137 in the environment was due to atmospheric testing of nuclear weapons. Cs-137 did not appear in the soils and sediment until approximately 1954 (Jaakkola et. al., 1983). The deepest initial detection of Cs-137 in sediment would be associated with 1954. Sediment with no detectable Cs-137 is considered to be deposited prior to 1954. The maximum atmospheric deposition of Cs-137 is projected to be 1963 (Robbins & Edgington, 1975; Albrecht et. al., 1998) because extensive weapon testing occurred prior to the Nuclear Test Ban Treaty becoming effective. Atmospheric deposition rates decreased dramatically after 1963.

A comparison of Cs-137 and 2,3,7,8-TCDD results from sediment samples was undertaken. As displayed in Table 8-7, the highest Cs-137 concentrations directly correspond to the highest 2,3,7,8-TCDD concentrations. This supports the information that the deposition of the most contaminated 2,3,7,8-TCDD occurred in the mid 1950s and 1960s (i.e., during the period of peak discharges from Lister Avenue) (Quadrini 2015).

For 10A, sediment deeper than four feet has no detectable Cs-137. This indicates deep sediment was in place prior to 1954. Cs-137 concentrations increase in shallower sediment with the highest concentration in the 1- to 3-foot depth. This also corresponds to the highest 2,3,7,8-TCDD concentration in Sample 10A (Table 8-8).

Sample 75A (located next to Sample 10A) also has the highest Cs-137 concentrations at 2 to 4 feet. The highest 2,3,7,8-TCDD (4,500 parts per trillion) is also from that depth (Table 8-8). A decrease in Cs-137 concentration is observed in shallow sediment also. Deep sediment samples were not collected at this location.

Sample 76A had Cs-137 samples to a depth of 5 feet. As shown in Table 8-8, Cs-137 was not detected in any samples which indicates the sediment was in place prior to 1954. 2,3,7,8-TCDD concentrations are also very low at Sample 76A. Sample 76A is the most downriver sample from the other samples. The lack of Cs-137 supports that this area was not dredged for barges and undistributed sediment from at least 1954.

Sample 90A was only analyzed for Cs-137 (no 2,3,7,8-TCDD analyzed). A significant Cs-137 concentration was at a sample depth of 4 to 5 feet. This depth was the highest Cs-137 concentration of the five samples adjacent to RIP locations. The deepest interval sampled (8 to 9 feet) contains Cs-137 indicating deposition at this depth occurred after 1954. No deeper samples were collected to determine pre-1954 sediment depth.

In 1995 sediment samples were collected slightly downriver from RIP at approximately RM 6.73. These samples are identified as Sediment Samples 276, 277, and 278 (Figure 8-6).

The correlation of the highest Cs-137 results corresponding to the highest 2,3,7,8-TCDD results is also demonstrated in three core samples (276, 277, 278) collected immediately downriver from RIP (Table 8-8). The Cs-137 results indicate that sediment deposition with the highest 2,3,7,8-TCDD also occurred in the 1960s at these locations. Sample 276 is located downriver from RIP on the west side of the river (same side as RIP) while Samples 277 and 278 are located in the navigation channel.

The highest Cs-137 concentration at Sample 276 also has the highest 2,3,7,8-TCDD concentration (9 to 10 feet). No Cs-137 or 2,3,7,8-TCDD was detected below 12 feet, indicating sediment below 12 feet would have been deposited before 1954.

In Sample 277, the highest Cs-137 concentration (1-2 feet) also has the highest 2,3,7,8-TCDD concentration. Cs-137 was not detected at 3 to 4 feet. 2,3,7,8-TCDD was not detected at 4 to 5 feet depth.

In Sample 278, the highest 2,3,7,8-TCDD concentration corresponds to samples between 1 to 3 feet which are also the highest Cs-137 concentrations. The deepest sample collected at Sample 278 (3 to 4 feet) contained 2,3,7,8-TCDD and Cs-137 (Table 8-8).

8.4 SEDIMENTATION RATES AND 1971 SEDIMENT HORIZON

Expanding on the Cs-137 data presented in Section 8.3, analysis of sedimentation rates was conducted for the Passaic River adjacent to RIP. The objective of the sedimentation rate analysis is to estimate the sediment horizon in 1971 when PPG ceased operations at NCF.

As explained in Section 8.3, the highest Cs-137 concentration in Passaic River sediment is associated with the year 1963. Erikson (2007) calculated average sedimentation rate of 2 cm/year for the Arlington Reach (RIP is located in this reach). Four sediment sample locations centrally located along the RIP bulkhead wall were considered by Erickson (2007) in determining the average sedimentation rate (Locations 10A, 75A, 76A, and 90A). These locations (Figure 8-3) are in the barge berth dredging area (Section 5.4.4).

Using the average sedimentation rate determined by Erikson (2007), an accumulation of 18 cm (0.6 foot) would occur between 1963 (peak Cs-137 concentration) and 1971 (when PPG ceased NCF operations). Table 8-9 shows the Cs-137 concentration by depth for the samples evaluated for the 1971 sedimentation horizon. As shown in Table 8-10 and Figure 8-7, the estimated sediment depth in 1971 would range from 1.5 (Sample 10A) to 4.2 (Sample 90A) feet below the sediment surface. As a result, any COC concentrations detected in RIP sediment above the 1971 sediment horizon were deposited after 1971 and are not associated with the NCF. For example, the highest mercury concentration identified adjacent to the RIP is at sediment Sample Location 90A (16.3 mg/kg) and collected at a depth between 1.84 and 2.0 feet. As noted above, the 1971 sediment horizon at Sample Location 90A is at 4.2 feet, two feet below this sample.

8.5 PASSAIC RIVER SEDIMENT SUMMARY

The overall concentration pattern is that shallow sediment concentrations are higher in the downriver segment. This pattern is also consistent for deep sediments. The sediment concentrations adjacent to RIP are lower than downriver concentrations indicating that NCF/RIP is not a source of the key Lower Passaic River COCs (dioxins/furans, PCBs, DDx and mercury) in the Passaic River sediments.

Depending on location, sediments deposited adjacent to the RIP after 1971 (when the NCF operations ceased) range from 1.5 to 4.2 feet below the sediment surface. Any COCs in sediments deposited after 1971 would not be associated with NCF.

The highest 2,3,7,8-TCDD concentrations correspond to the highest Cs-137 concentration, which is consistent with the FFS findings (Louis Berger, 2014). This finding indicates the most contaminated sediment was deposited during the mid-1950s and 1960s, which is consistent with peak discharges from the Lister Avenue site.

The ratios of 2,3,7,8-TCDD to total TCDD are above 0.6. Ratios above the value are associated with 2,4,5-T manufacturing, and are consistent with ratios calculated by others for fingerprinting the Lister Avenue site source.

The average congener fingerprint (Table 8-7) was found to be very similar to the fingerprint plots developed for samples at/adjacent to the Lister Avenue site. As discussed in the Quadrini article, congener fingerprints dominated by 2,3,7,8-TCDD; OCDF; and 1,2,3,4,6,7,8-HpCDF are predominantly related to the Lister Avenue site source. Similarly, the homolog profile for the RIP sediments is very similar to that developed for RM 0-8 in the Quadrini article.

These ratios and congener and homolog fingerprints support the conclusion that PCDD/F being reported in the sediment near RIP can be attributable to PCDD/F discharges from the Lister Avenue site.

These findings indicate that NCF did not contribute COCs to the Passaic River.

9. REFERENCES

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TABLES

Table 3-1
Fraction of Original Material Remaining After a Given Number of Half-lives

Number of Half-lives	Fraction Remaining	Number of Half-lives	Fraction Remaining
0 (Starting amount)	1 or all	30	9.313×10^{-10}
1	0.5	35	2.910×10^{-11}
2	0.25	40	9.095×10^{-13}
3	0.125	45	2.842×10^{-14}
4	0.0625	50	8.882×10^{-16}
5	0.03125		
10	0.000976562		
15	0.00030517		
20	0.00000953		
25	0.00000029		

TABLE 7-1
DIOXIN AND FURAN RESULTS
2011 SOIL SAMPLE⁽¹⁾
RIP

Parameter	Sample I.D.
	NS-11 ⁽²⁾
	picograms per gram
2,3,7,8-TCDD	216
1,2,3,7,8-PeCDD	7.12
1,2,3,4,7,8-HxCDD	5.43
1,2,3,6,7,8-HxCDD	7.58
1,2,3,7,8,9-HxCDD	4.92
1,2,3,4,6,7,8-HpCDD	165
1,2,3,4,6,7,8,9-OCDD	2,800
2,3,7,8-TCDF	13.0
1,2,3,7,8-PeCDF	6.32
2,3,4,7,8-PeCDF	8.96
1,2,3,4,7,8-HxCDF	12.9
1,2,3,6,7,8-HxCDF	4.32
2,3,4,6,7,8-HxCDF	5.20
1,2,3,7,8,9-HxCDF	0.765
1,2,3,4,6,7,8-HpCDF	70.5
1,2,3,4,7,8,9-HpCDF	3.10
1,2,3,4,6,7,8,9-OCDF	158
Total Tetrachlorodibenzo-p-dioxin	310
Total Pentachlorodibenzo-p-dioxin	106
Total Hexachlorodibenzo-p-dioxin	143
Total Heptachlorodibenzo-p-dioxin	362
Total Tetrachlorodibenzofuran	198
Total Pentachlorodibenzofuran	174
Total Hexachlorodibenzofuran	120
Total Heptachlorodibenzofuran	158
TEQ WHO2005 ND=0	235
TEQ WHO2005 ND=0.5	235
2,3,7,8-TCDD/Total TCDD	0.7

Notes:

⁽¹⁾ Soil samples (0-1 inch depth) collected by Lockheed Martin/SERAS in April 2011. Samples were collected from area between Buildings 7 and 12, and Building 6 and along the Passaic River.

⁽²⁾ Soil Sample NS-11 had the highest TEQ.

Table 8-1
Sediment Samples

Sample Depth Range: 0.0-2.5									
River Region: Up-River				River Region: RIP-Adjacent		River Region: Down-River			
SampleLocation	FieldSampleID	SampleLocation	FieldSampleID	SampleLocation	FieldSampleID	SampleLocation	FieldSampleID	SampleLocation	FieldSampleID
09A-TSI	09A001	2012 CLRC-0463	12A-0463-C2BS	10A-TSI	10A001	2008 CLRC-038	08A-0038-C1AS	267-TSI	26703A
09A-TSI	09A005	2012 CLRC-0463	12A-0463-C2CS	10A-TSI	10A012	2008 CLRC-038	08A-0038-C1BS	268-TSI	26801B
09A-TSI	09A010	2012 CLRC-0464	12A-0464-C4AS	75A-TSI	75A001	2008 CLRC-038	08A-0038-C1CS	268-TSI	26802B
2008 CLRC-046	08A-0046-C2AS	2012 CLRC-0464	12A-0464-C4BS	75A-TSI	75A012	2008 CLRC-038	08A-0038-C2AS	268-TSI	26803B
2008 CLRC-046	08A-0046-C2BS	2012 CLRC-0464	12A-0464-C4CS	76A-TSI	76A001	2008 CLRC-038	08A-0038-C2CS	269-TSI	26901C
2008 CLRC-047	08A-0047-C1AS	2012 CLRC-0464	12A-0464-C5BS	76A-TSI	76A012	2008 CLRC-039	08A-0039-C1AS	269-TSI	26902C
2008 CLRC-047	08A-0047-C1BS	2012 CLRC-0464	12A-0464-C5CS	90A-TSI	90A001	2008 CLRC-039	08A-0039-C1BS	270-TSI	27001A
2008 CLRC-047	08A-0047-C1CS	2012 CLRC-0465	12A-0465-C3AS	90A-TSI	90A012	2008 CLRC-039	08A-0039-C1CS	270-TSI	27002A
2008 CLRC-047	08A-0047-C4AS	2012 CLRC-0465	12A-0465-C3BS	EPA-1993-24858-TSI	EPA-1993-24858	2008 CLRC-039	08A-0039-C2AS	270-TSI	27003A
2008 CLRC-047	08A-0047-C4BS	2012 CLRC-0465	12A-0465-C3CS	HP10-TSI	HP10	2008 CLRC-039	08A-0039-C2BS	270-TSI	27004A
2008 CLRC-047	08A-0047-C4CS	2012 CLRC-0465	12A-0465-C4AS	HP1-TSI	HP1	2008 CLRC-040	08A-0040-C1AS	271-TSI	27101A
2008 CLRC-047	08A-0047-D4AS	2012 CLRC-0465	12A-0465-C4BS	HP2-TSI	HP2	2008 CLRC-040	08A-0040-C1BS	271-TSI	27102A
2008 CLRC-047	08A-0047-D4BS	2012 CLRC-0465	12A-0465-C4CS	HP3-TSI	HP3	2008 CLRC-040	08A-0040-C1CS	271-TSI	27103A
2008 CLRC-047	08A-0047-D4CS	2013 CLRC2-0501	13B-0501-C1AS	HP4-TSI	HP4	2008 CLRC-040	08A-0040-C3AS	272-TSI	27201A
2008 CLRC-047	08A-0047-D4DS	2013 CLRC2-0501	13B-0501-C1BS	HP5-TSI	HP5	2008 CLRC-040	08A-0040-C3BS	272-TSI	27202A
2008 CLRC-047	08A-0047-D4ES	2013 CLRC2-0501	13B-0501-C1CS	HP6-TSI	HP6	2008 CLRC-040	08A-0040-C3CS	273-TSI	27301A
2008 CLRC-048	08A-0048-C2AS	2013 CLRC2-0501	13B-0501-C2AS	HP7-TSI	HP7	2008 CLRC-041	08A-0041-C1AS	273-TSI	27302A
2008 CLRC-048	08A-0048-C2BS	2013 CLRC2-0502	13B-0502-C2AS	HP8-TSI	HP8	2008 CLRC-041	08A-0041-C1BS	273-TSI	27303A
2008 CLRC-048	08A-0048-C2CS	2013 CLRC2-0502	13B-0502-C2BS	HP9-TSI	HP9	2008 CLRC-041	08A-0041-C1CS	274-TSI	27401A
2008 CLRC-048	08A-0048-C3AS	2013 CLRC2-0502	13B-0502-C2CS	LPRC07B	LPRC07B	2008 CLRC-041	08A-0041-C2AS	274-TSI	27402A
2008 CLRC-048	08A-0048-C3BS	2013 CLRC2-0503	13B-0503-C1AS	LPRC07D	LPRC07D	2008 CLRC-041	08A-0041-C2BS	274-TSI	27403A
2008 CLRC-048	08A-0048-C3CS	2013 CLRC2-0503	13B-0503-C1BS	LPRT07E	LPRT07E	2008 CLRC-041	08A-0041-C2CS	275-TSI	27501A
2008 CLRC-049	08A-0049-C1AS	2013 CLRC2-0503	13B-0503-C1CS	LPRT08A	LPRT08A	2008 CLRC-042	08A-0042-C1AS	275-TSI	27502A
2008 CLRC-049	08A-0049-C1BS	2013 CLRC2-0503	13B-0503-C1DS	PR0012SDM-TSI	PR0012SDM	2008 CLRC-042	08A-0042-C1BS	275-TSI	27503A
2008 CLRC-049	08A-0049-C1CS	2013 CLRC2-0503	13B-0503-C2AS	PR00SD12-TSI	PR00SD12	2008 CLRC-042	08A-0042-C1CS	276-TSI	27601A
2008 CLRC-050	08A-0050-C1AS	2013 CLRC2-0504	13B-0504-C2AS	PR9912SDL-TSI	PR9912SDL	2008 CLRC-042	08A-0042-C2AS	276-TSI	27602A
2008 CLRC-050	08A-0050-C1BS	2013 CLRC2-0504	13B-0504-C2BS	PR9912SDM-TSI	PR9912SDM	2008 CLRC-042	08A-0042-C2BS	277-TSI	27701B
2008 CLRC-050	08A-0050-C1CS	2013 CLRC2-0504	13B-0504-C2CS	PR9912SDU-TSI	PR9912SDU	2008 CLRC-042	08A-0042-C2CS	277-TSI	27702B
2008 CLRC-050	08A-0050-C2AS	2013 CLRC2-0504	13B-0504-C4AS	SD-1	SD-1	2012 CLRC-0448	12A-0448-C2AS	277-TSI	27703B
2008 CLRC-050	08A-0050-C2BS	2013 CLRC2-0504	13B-0504-C4BS	SD-2	SD-2	2012 CLRC-0448	12A-0448-C2BS	278-TSI	27801B
2008 CLRC-050	08A-0050-C2CS	2013 CLRC2-0504	13B-0504-C4CS	SD-3	SD-3	2012 CLRC-0448	12A-0448-C2CS	278-TSI	27802B
2008 CLRC-050	08A-0050-C3BS	2013 CLRC2-0505	13B-0505-C1AS	SD-4	SD-4	2012 CLRC-0448	12A-0448-C3AS	278-TSI	27803B
2008 CLRC-051	08A-0051-C1AS	2013 CLRC2-0505	13B-0505-C1BS	SD-5	SD-5	2012 CLRC-0448	12A-0448-G1AS	278-TSI	27804B
2008 CLRC-051	08A-0051-C1BS	2013 CLRC2-0505	13B-0505-C1CS	SD-6	SD-6	2012 CLRC-0449	12A-0449-C4AS	296-TSI	29601B
2008 CLRC-051	08A-0051-C2AS	2013 CLRC2-0505	13B-0505-C2AS	TIE5-C-TSI	TIE5-C	2012 CLRC-0449	12A-0449-C4BS	296-TSI	29602B
2008 CLRC-051	08A-0051-C2BS	2013 CLRC2-0505	13B-0505-C2CS			2012 CLRC-0449	12A-0449-C4CS	296-TSI	29603B
2008 CLRC-051	08A-0051-C2CS	2013 CLRC2-0506	13B-0506-C2AS			2012 CLRC-0449	12A-0449-C5AS	G0000029	LPRP-SCSH-PSR-001409
2008 CLRC-051	08A-0051-C4CS	2013 CLRC2-0506	13B-0506-C2BS			2012 CLRC-0449	12A-0449-C5BS	G0000029	LPRP-SCSH-PSR-001410
2008 CLRC-052	08A-0052-C2AS	2013 CLRC2-0506	13B-0506-C2CS			2012 CLRC-0449	12A-0449-C5CS	G0000029	LPRP-SCSH-PSR-001433
2008 CLRC-052	08A-0052-C3AS	2013 CLRC2-0506	13B-0506-C3AS			2012 CLRC-0450	12A-0450-C2AS	G0000029	LPRP-SCSH-PSR-001434
2012 CLRC-0458	12A-0458-C2AS	2013 CLRC2-0506	13B-0506-C3BS			2012 CLRC-0450	12A-0450-C4AS	G0000053	LPRP-SCSH-PSR-001593
2012 CLRC-0458	12A-0458-C3AS	2013 CLRC2-0507	13B-0507-C2AS			2012 CLRC-0450	12A-0450-C4BS	LPRC07A	LPRC07A
2012 CLRC-0458	12A-0458-C3BS	2013 CLRC2-0507	13B-0507-C2BS			2012 CLRC-0450	12A-0450-C4CS	LPRT06F	LPRT06F
2012 CLRC-0458	12A-0458-C3CS	2013 CLRC2-0507	13B-0507-C2CS			2012 CLRC-0451	12A-0451-C2AS	LPRT07A	LPRT07A
2012 CLRC-0459	12A-0459-C2AS	2013 CLRC2-0507	13B-0507-C3AS			2012 CLRC-0451	12A-0451-C2BS	LPRT07B	LPRT07B
2012 CLRC-0459	12A-0459-C2BS	C01	C01-SD1-000-006			2012 CLRC-0451	12A-0451-C2CS	LPRT07C	LPRT07C
2012 CLRC-0459	12A-0459-C2CS	G0000046	LPRP-SCSH-PSR-001586			2012 CLRC-0451	12A-0451-C3AS	NOAA2-03-TSI	NOAA2-03
2012 CLRC-0459	12A-0459-C3AS	LPRC08A	LPRC08A			2012 CLRC-0452	12A-0452-C4AS	PR0011SDM-TSI	PR0011SDM
2012 CLRC-0460	12A-0460-C1AS	LPRT08B	LPRT08B			2012 CLRC-0452	12A-0452-C5AS	PR00SD11-TSI	PR00SD11
2012 CLRC-0460	12A-0460-C1BS	LPRT08C	LPRT08C			2012 CLRC-0452	12A-0452-C5BS	PR9911SDL-TSI	PR9911SDL
2012 CLRC-0460	12A-0460-C1CS	LPRT08D	LPRT08D			2012 CLRC-0452	12A-0452-C5CS	PR9911SDM-TSI	PR9911SDM
2012 CLRC-0460	12A-0460-C3AS	LPRT08E	LPRT08E			2012 CLRC-0453	12A-0453-C5AS	PR9911SDU-TSI	PR9911SDU
2012 CLRC-0460	12A-0460-C3BS	Q:QM:NOAAHRT2:02	Q:1502:9300:27			2012 CLRC-0453	12A-0453-C5BS	PRP-99-04-TSI	PRP-99-04-SD-1
2012 CLRC-0460	12A-0460-C3CS	R9-TSI	R9			2012 CLRC-0453	12A-0453-C5CS	PRP-99-04-TSI	PRP-99-04-SD-2
2012 CLRC-0461	12A-0461-C1AS	SR10-TSI	SR10			2012 CLRC-0453	12A-0453-C6AS	Q:QM:NOAAHRT2:03	Q:1503:9300:02
2012 CLRC-0461	12A-0461-C1BS	SR1-TSI	SR1			2012 CLRC-0454	12A-0454-C3AS		
2012 CLRC-0461	12A-0461-C1CS	SR2-TSI	SR2			2012 CLRC-0454	12A-0454-C3BS		
2012 CLRC-0461	12A-0461-C3AS	SR3-TSI	SR3			2012 CLRC-0454	12A-0454-C3CS		
2012 CLRC-0461	12A-0461-C3BS	SR4-TSI	SR4			2012 CLRC-0456	12A-0456-C1AS		
2012 CLRC-0461	12A-0461-C3CS	SR5-TSI	SR5			2012 CLRC-0456	12A-0456-C1BS		
2012 CLRC-0462	12A-0462-C5AS	SR6-TSI	SR6			2012 CLRC-0456	12A-0456-C1CS		
2012 CLRC-0462	12A-0462-C5BS	SR7-TSI	SR7			2012 CLRC-0456	12A-0456-C3AS		
2012 CLRC-0462	12A-0462-C5CS	SR8-TSI	SR8			267-TSI	26701A		
2012 CLRC-0462	12A-0462-C6AS	SR9-TSI	SR9			267-TSI	26702A		
2012 CLRC-0463	12A-0463-C2AS								

Table 8-1
Sediment Samples

Sample Depth Range: 2.5-6.0							
River Region: Up-River		River Region: Up-River		River Region: RIP-Adjacent		River Region: Down-River	
SampleLocation	FieldSampleID	SampleLocation	FieldSampleID	SampleLocation	FieldSampleID	SampleLocation	FieldSampleID
2008 CLRC-038	08A-0038-C1DS	270-TSI	27007A	10A-TSI	10A024	2008 CLRC-047	08A-0047-C1DS
2008 CLRC-038	08A-0038-C1ES	271-TSI	27104A	75A-TSI	75A024	2008 CLRC-047	08A-0047-C1ES
2008 CLRC-038	08A-0038-C2DS	271-TSI	27107A	76A-TSI	76A024	2008 CLRC-047	08A-0047-C4DS
2008 CLRC-038	08A-0038-C2ES	272-TSI	27203A	90A-TSI	90A024	2008 CLRC-048	08A-0048-C2DS
2008 CLRC-039	08A-0039-C1DS	272-TSI	27204A			2008 CLRC-048	08A-0048-C2ES
2008 CLRC-039	08A-0039-C1ES	273-TSI	27304A			2008 CLRC-048	08A-0048-C3DS
2008 CLRC-039	08A-0039-C2DS	273-TSI	27305A			2008 CLRC-048	08A-0048-C3ES
2008 CLRC-040	08A-0040-C1DS	273-TSI	27306A			2008 CLRC-049	08A-0049-C1DS
2008 CLRC-040	08A-0040-C1ES	274-TSI	27404A			2008 CLRC-049	08A-0049-C2DS
2008 CLRC-041	08A-0041-C1DS	274-TSI	27405A			2008 CLRC-049	08A-0049-C2ES
2008 CLRC-041	08A-0041-C1ES	274-TSI	27406A			2008 CLRC-050	08A-0050-C1DS
2008 CLRC-041	08A-0041-C2DS	275-TSI	27504A			2013 CLRC2-0501	13B-0501-C1DS
2008 CLRC-042	08A-0042-C1DS	275-TSI	27505A			2013 CLRC2-0501	13B-0501-C2DS
2008 CLRC-042	08A-0042-C2DS	276-TSI	27603A			2013 CLRC2-0505	13B-0505-C1FS
2008 CLRC-042	08A-0042-C2ES	277-TSI	27704B			2013 CLRC2-0505	13B-0505-C2FS
267-TSI	26704A	277-TSI	27705B			2013 CLRC2-0507	13B-0507-C2DS
267-TSI	26705A	277-TSI	27706B			2013 CLRC2-0507	13B-0507-C3DS
267-TSI	26706A	278-TSI	27805B			C01	C01-SD1-030-036
268-TSI	26804B	278-TSI	27806B			G0000014	LPRP-SCSH-PSR-001253
268-TSI	26805B	296-TSI	29604B			G0000014	LPRP-SCSH-PSR-001554
268-TSI	26806B	296-TSI	29605B				
269-TSI	26904C	296-TSI	29606B				
269-TSI	26906C	G0000029	LPRP-SCSH-PSR-001411				
269-TSI	26907C	G0000029	LPRP-SCSH-PSR-001435				
270-TSI	27006A	PRP-99-04-TSI	PRP-99-04-SD-3				

Table 8-2
Summary of Shallow Sediment Results

Parameter: Mercury	Up-River	RIP-Adjacent	Down-River
Number of Sediment Results	89	34	94
Number of non-detects	0	0	0
Minimum Result (ppb)	5.17	120	256
Maximum Result (ppb)	26,900	16,300	15,800

Parameter: Total PCB	Up-River	RIP-Adjacent	Down-River
Number of Sediment Results	83	26	94
Number of non-detects	3	13	3
Minimum Result (ppb)	<0.0317	<66	<6.5
Maximum Result (ppb)	41,800	7,740	28,600

Parameter: 2,3,7,8-TCDD	Up-River	RIP-Adjacent	Down-River
Number of Sediment Results	90	27	93
Number of non-detects	7	0	0
Minimum Result (ppb)	<0.000191	0.00044	0.0187
Maximum Result (ppb)	34.1	32	36

Parameter: Total Pesticides	Up-River	RIP-Adjacent	Down-River
Number of Sediment Results	72	26	101
Number of non-detects	0	1	1
Minimum Result (ppb)	0.51	<3.85	<140
Maximum Result (ppb)	2,449.36	1,262.6	3,097

Notes:			
-Up-River: 7.05-8.05 river mile	-Sample depth range 0-2.5		
-Site-Adjacent: 6.80-7.05 river mile	-All results converted to parts per billion (ppb) from varying original units		
-Down-River: 5.80-6.80 river mile			

Only one RIP adjacent data set will be used. Both provided for comparison.

**Table 8-3
Summary of Deep Sediment Results**

Parameter: Mercury	Up-River	RIP-Adjacent	Down-River
Number of Sediment Results	11	4	44
Number of non-detects	0	0	3
Minimum Result (ppb)	12.3	1,500	<110
Maximum Result (ppb)	9,570	8,800	22,600

Parameter: Total PCB	Up-River	RIP-Adjacent	Down-River
Number of Sediment Results	10	3	43
Number of non-detects	3	2	17
Minimum Result (ppb)	<0.554	<86.9	<4.8
Maximum Result (ppb)	1,600	7,770	18,800

Parameter: 2,3,7,8-TCDD	Up-River	RIP-Adjacent	Down-River
Number of Sediment Results	11	3	44
Number of non-detects	4	0	6
Minimum Result (ppb)	<0.000178	0.00056	<0.00061
Maximum Result (ppb)	0.597	4.5	48.9

Parameter: Total Pesticides	Up-River	RIP-Adjacent	Down-River
Number of Sediment Results	10	3	47
Number of non-detects	2	1	6
Minimum Result (ppb)	<0.078	<4.64	<3.92
Maximum Result (ppb)	260.44	507	4,256

Notes:			
-Up-River: 7.05-8.05 river mile	-Sample depth range 2.5-6.0		
-Site-Adjacent: 6.80-7.05 river mile	-All results converted to parts per billion (ppb) from varying original units		
-Down-River: 5.80-6.80 river mile			

Only one RIP adjacent data set will be used. Both provided for comparison.

TABLE 8-4
AVERAGE SEDIMENT CONCENTRATION⁽¹⁾
PER RIVER REGION
PASSAIC RIVER

Parameter	Up-River ⁽²⁾		RIP-Adjacent ⁽³⁾		Down-River ⁽⁴⁾	
	Shallow ⁽⁵⁾	Deep ⁽⁶⁾	Shallow	Deep	Shallow	Deep
2,3,7,8-TCDD (ppb)	3.05	0.08	1.74	1.51	2.87	4.87
Total PCBs (ppm)	2.56	0.27	0.90	2.59	2.91	2.64
Total DDX (ppb)	290	50.4	159	171	400	749
Mercury (ppm)	4.18	2.18	3.88	4.30	3.90	7.36

Notes:

⁽¹⁾ Non-detects replaced by zero to calculate average.

⁽²⁾ River Mile 7.05 to 8.05.

⁽³⁾ River Mile 6.8 to 7.05.

⁽⁴⁾ River Mile 5.8 to 6.8.

⁽⁵⁾ Shallow - 0 to 2.5 feet.

⁽⁶⁾ Deep - 2.5 to 6.0 feet.

Table 8-5: Shallow Sediment Statistical Comparison Summary
Lower Passaic River Sediment Data

Analyte	Median conc. (ug/kg, K-M method)			Conclusion of Statistical Comparisons
	upriver	RIP Adjacent	downriver	
2,3,7,8-TCDD	0.111 b	0.37 ab	0.572 a	Downriver concentrations are higher than upriver concentrations. RIP adjacent concentrations are not different than either.
PCB, Total	462 b	66 b	1660 a	Downriver concentrations are higher than RIP adjacent and upriver concentrations. RIP adjacent and upriver concentrations are similar to one another.
DDx, Total	123.6 b	94.5 b	177.4 a	Downriver concentrations are higher than RIP adjacent and upriver concentrations. RIP Adjacent and upriver concentrations are similar.
Mercury	1780 b	2900 ab	2870 a	Downriver concentrations are higher than upriver concentrations. RIP adjacent concentrations are not different than either.

Notes:

All concentrations in ug/kg.

Shallow sediments are 0-2.5 feet

Median concentrations that share matching letters ("a", "b", etc.) are not significantly different, based on a Gehan Test.

Medians were calculated using the Kaplan-Meier ("K-M") approach. JMP Version 8.0.2 was used to calculate medians for 2,3,6,7,8-TCDD and Mercury, while Practical Stats KMStats Version 1.6 was used to calculate medians for DDx and PCB totals respectively. In cases where nondetects represent >50% of the data set, and the lowest value is a nondetect, the median can not be calculated by the KM method and is represented as a value below lowest detection limit.

Upriver River Mile (RM) 7.05 to 8.05; RIP Adjacent RM 6.80 to 7.05; Downriver RM 5.80 to 6.80.

Table 8-6: Deep Sediment Statistical Comparison Summary
Lower Passaic River Sediment Data

Analyte	Median conc. (ug/kg, K-M method)			Conclusion of Statistical Comparisons
	upriver	RIP Adjacent	downriver	
2,3,7,8-TCDD	0.00165 b	0.031 ab	1.26 a	Because of small number of deep sediment samples, statistical comparisons between river segments are not reliable.
PCB, Total	1.94 b	86.9 ab	540 a	Because of small number of deep sediment samples, statistical comparisons between river segments are not reliable.
DDx, Total	0.4069 b	5 ab	457.5 a	Because of small number of deep sediment samples, statistical comparisons between river segments are not reliable.
Mercury	425 b	2300 ab	6200 a	Because of small number of deep sediment samples, statistical comparisons between river segments are not reliable.

Notes:

All concentrations in ug/kg.

Deep sediments are 2.5-6 feet

Median concentrations that share matching letters ("a", "b", etc.) are not significantly different, based on a Gehan Test.

Medians were calculated using the Kaplan-Meier ("K-M") approach. JMP Version 8.0.2 was used to calculate medians for 2,3,6,7,8-TCDD and Mercury, while Practical Stats KMStats Version 1.6 was used to calculate medians for DDx and PCB totals respectively. In cases where nondetects represent >50% of the data set, and the lowest value is a nondetect, the median can not be calculated by the KM method and is represented as a value below lowest detection limit.

Parameters with small sample sizes for at least one river grouping (<8 results) are flagged as "Small sample size - test results not reliable". Results of these statistical tests should be interpreted with caution.

Upriver River Mile (RM) 7.05 to 8.05; RIP Adjacent RM 6.80 to 7.05; Downriver RM 5.80 to 6.80.

Table 8-7
Dioxins/Furans Congener and Homolog Ratio
Sediment Samples
Lower Passaic River
Riverside Industrial Park
Newark, New Jersey

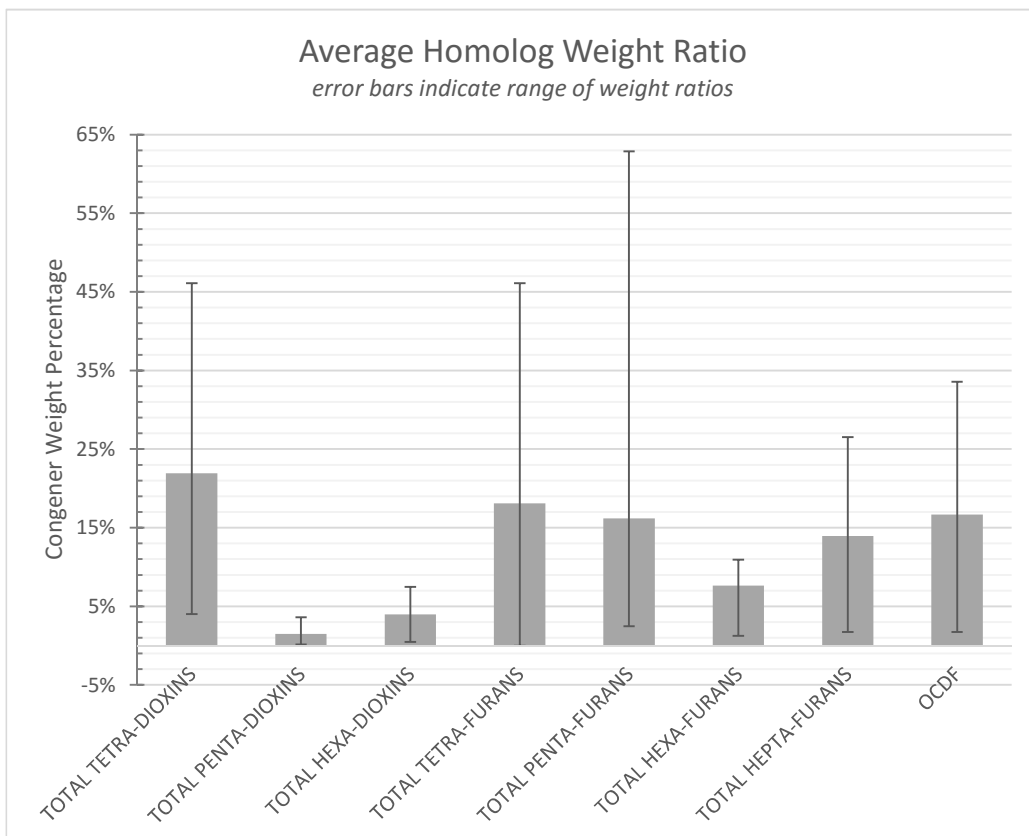
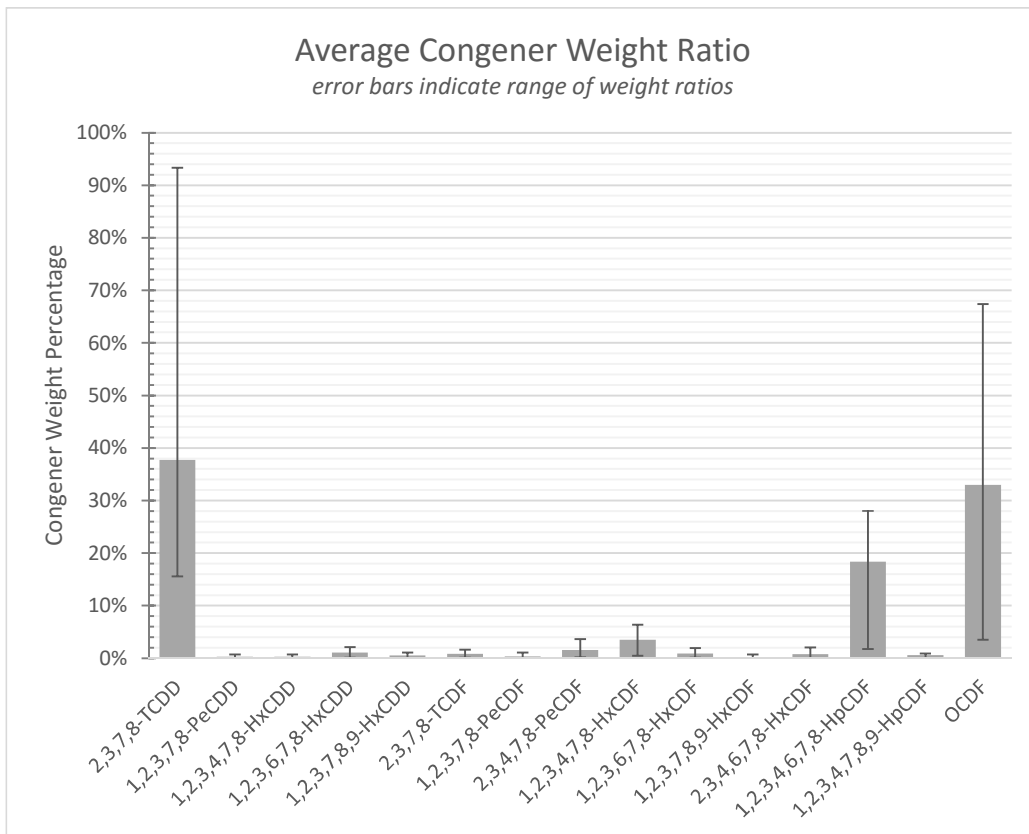
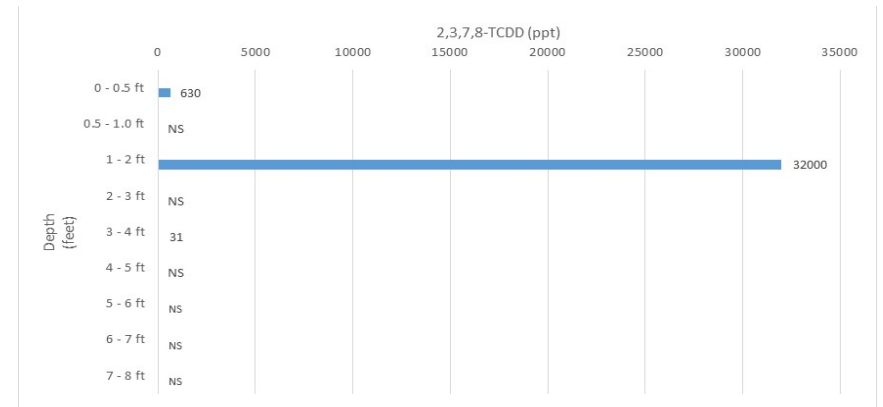
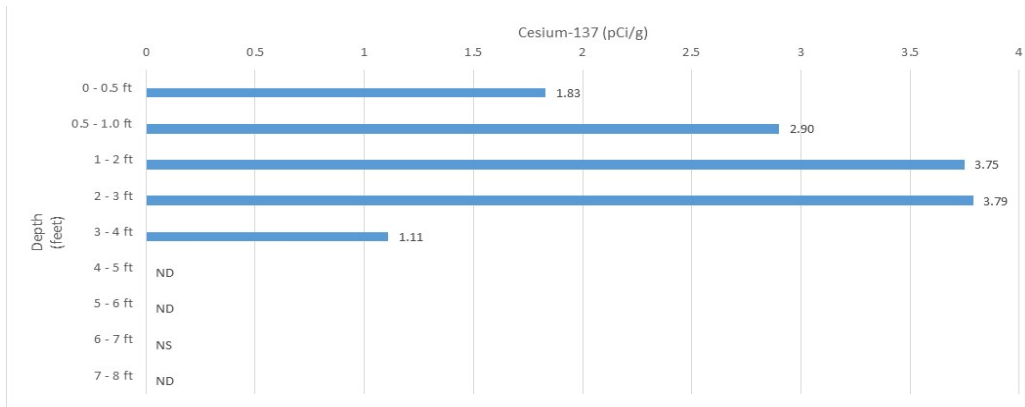
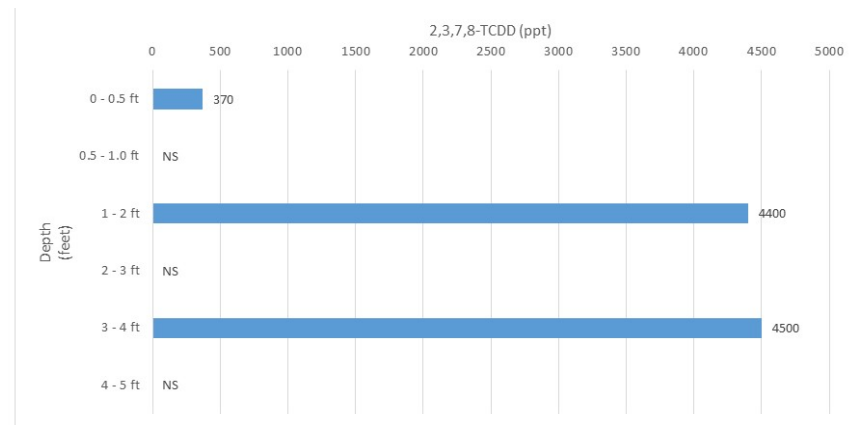
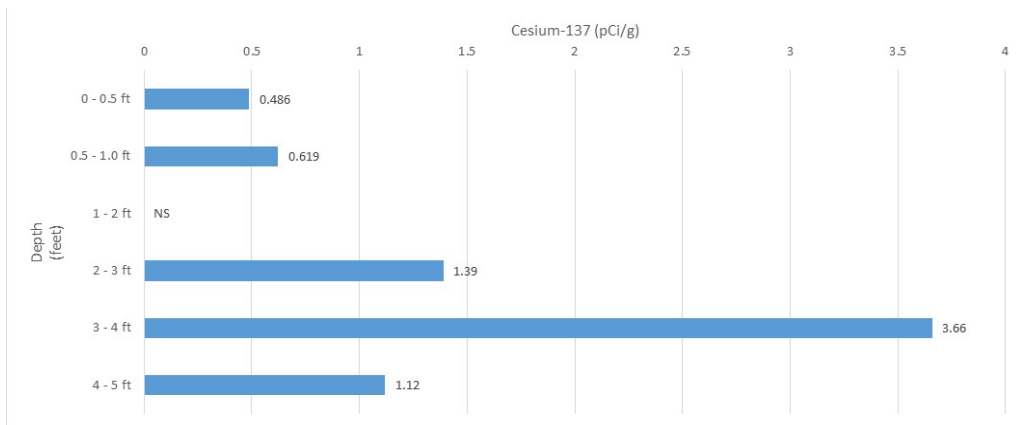


TABLE 8-8
CESIUM-137 AND 2,3,7,8-TCDD RESULTS
SEDIMENT CORES
LOWER PASSAIC RIVER
RIVERSIDE INDUSTRIAL PARK
NEWARK, NEW JERSEY

Sediment Core 10A



Sediment Core 75A



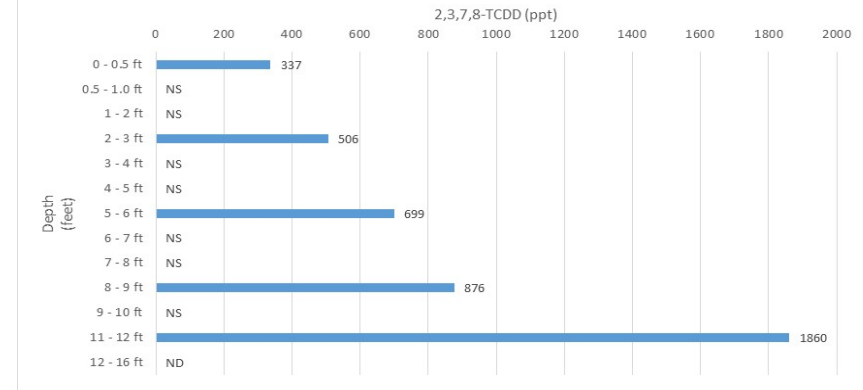
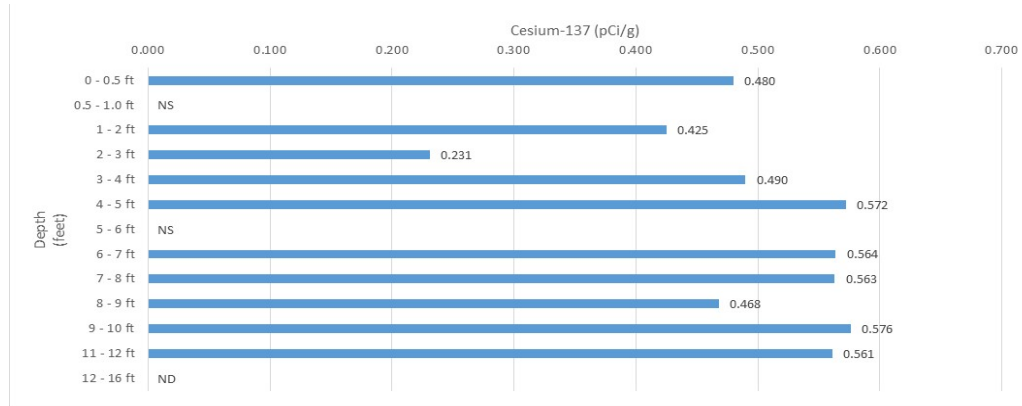
NOTES:

ND - not detected

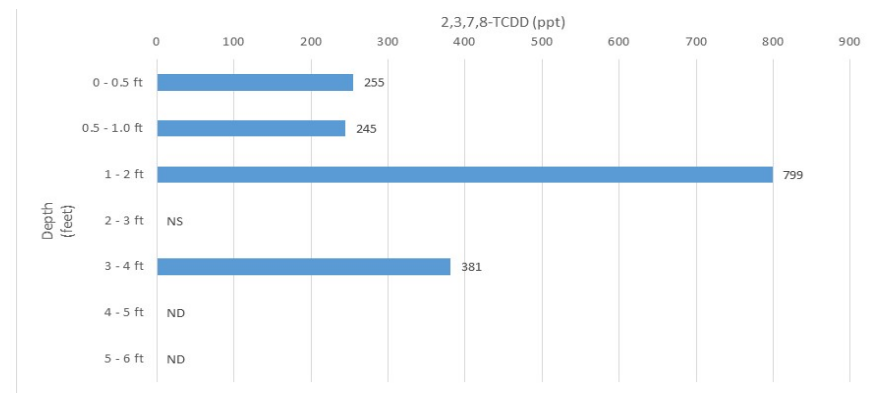
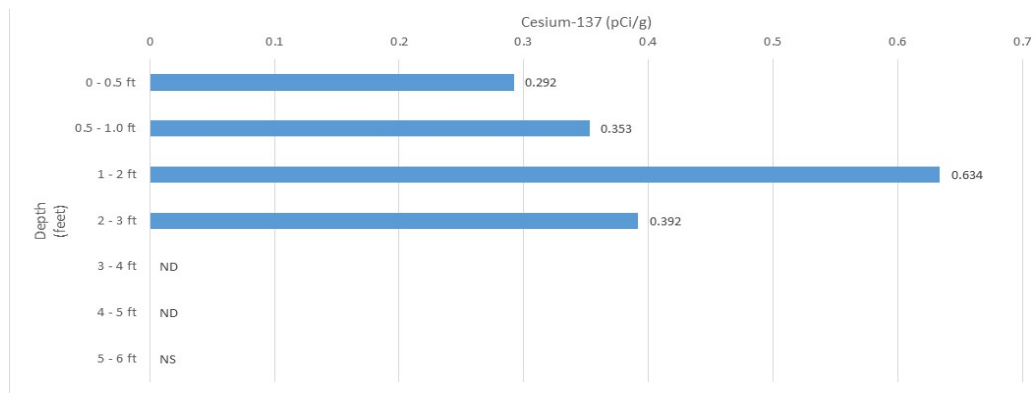
NS - not sampled

TABLE 8-8
CESIUM-137 AND 2,3,7,8-TCDD RESULTS
SEDIMENT CORES
LOWER PASSAIC RIVER
RIVERSIDE INDUSTRIAL PARK
NEWARK, NEW JERSEY

Sediment Core 276



Sediment Core 277



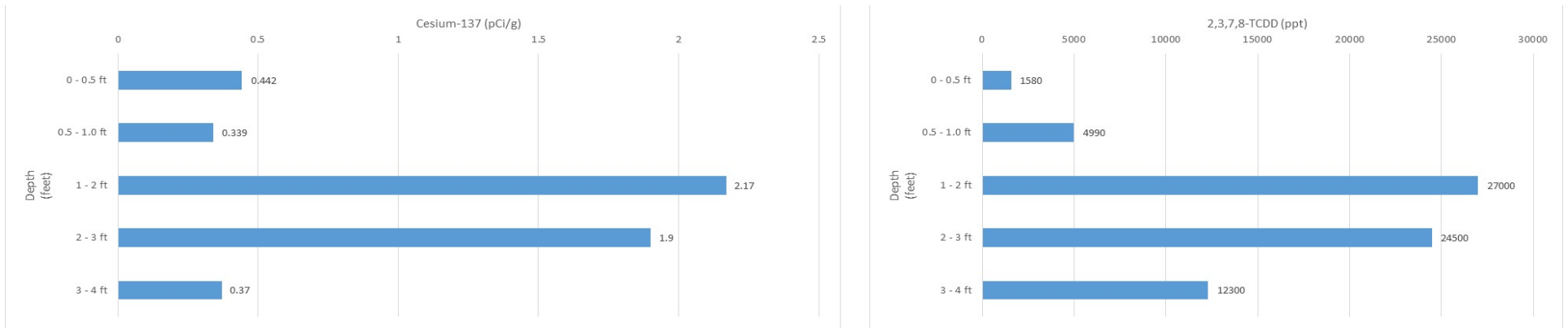
NOTES:

ND - not detected

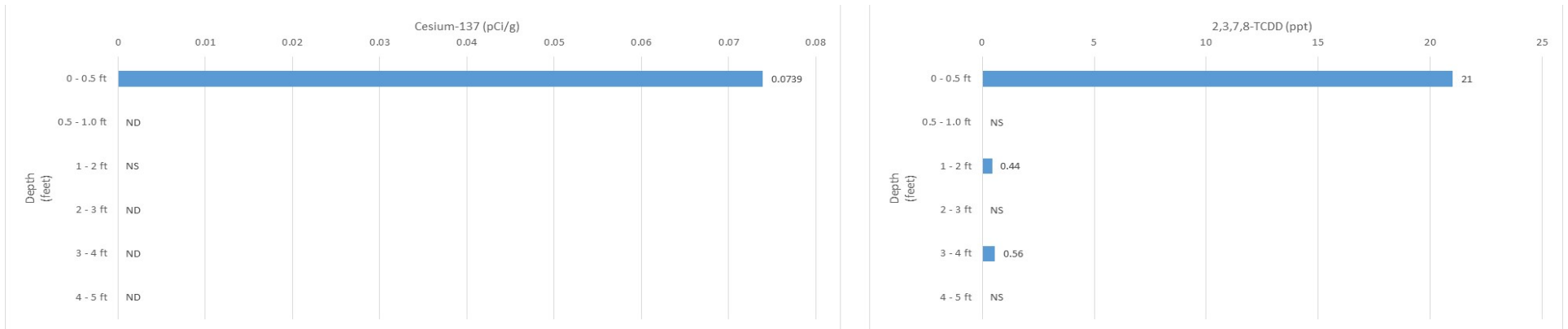
NS - not sampled

TABLE 8-8
CESIUM-137 AND 2,3,7,8-TCDD RESULTS
SEDIMENT CORES
LOWER PASSAIC RIVER
RIVERSIDE INDUSTRIAL PARK
NEWARK, NEW JERSEY

Sediment Core 278



Sediment Core 76A



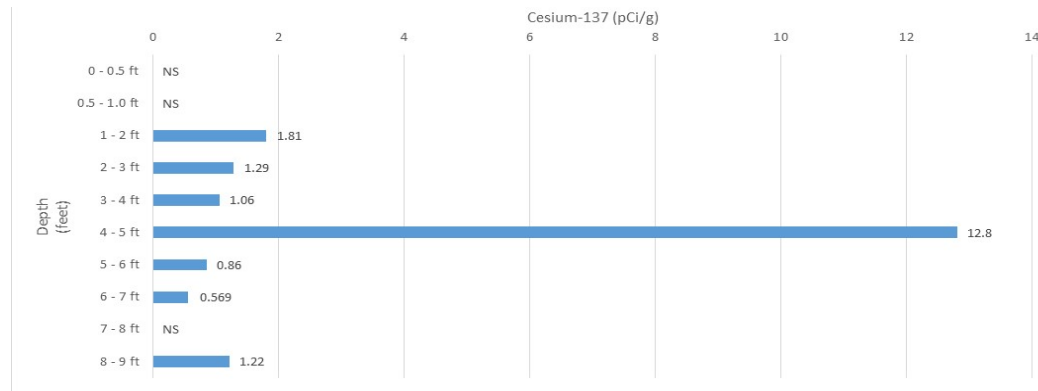
NOTES:

ND - not detected

NS - not sampled

TABLE 8-8
CESIUM-137 AND 2,3,7,8-TCDD RESULTS
SEDIMENT CORES
LOWER PASSAIC RIVER
RIVERSIDE INDUSTRIAL PARK
NEWARK, NEW JERSEY

Sediment Core 90A



NOTES:

NS - not sampled

Table 8-9
Cesium-137 Results
Lower Passaic River
Riverside Industrial Park
Newark, New Jersey

Sample Location	10A-TSI	10A-TSI	10A-TSI	10A-TSI	10A-TSI	10A-TSI	10A-TSI	10A-TSI	10A-TSI	75A-TSI	75A-TSI	75A-TSI	75A-TSI	75A-TSI	90A-TSI	90A-TSI	90A-TSI	90A-TSI	90A-TSI	90A-TSI	90A-TSI	90A-TSI	90A-TSI	90A-TSI
River Mile	6.91	6.91	6.91	6.91	6.91	6.91	6.91	6.91	6.91	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94
Field Sample ID	10A002	10A004	10A006	10A009	10A013	10A019	10A025	10A031	10A043	75A002A	75A006	75A013	75A019	75A025	90A007	90A011	90A017	90A023	90A027	90A029	90A031	90A035	90A039	90A049
Sample Depth	0.25	0.625	0.9	1.43	2.1	3.1	4.1	5.1	7.1	0.21	0.9	2.1	3.1	4.1	1.1	1.8	2.7	3.8	4.4	4.8	5.1	5.7	6.4	8
Cesium-137 (pCi/gm)	1.83	2.9	2.18	3.75	3.79	1.11	<0.04	<0.05	<0.1	0.486	0.619	1.39	3.66	1.12	1.81	1.38	1.29	1.06	0.803	12.8	0.86	0.777	0.569	1.22

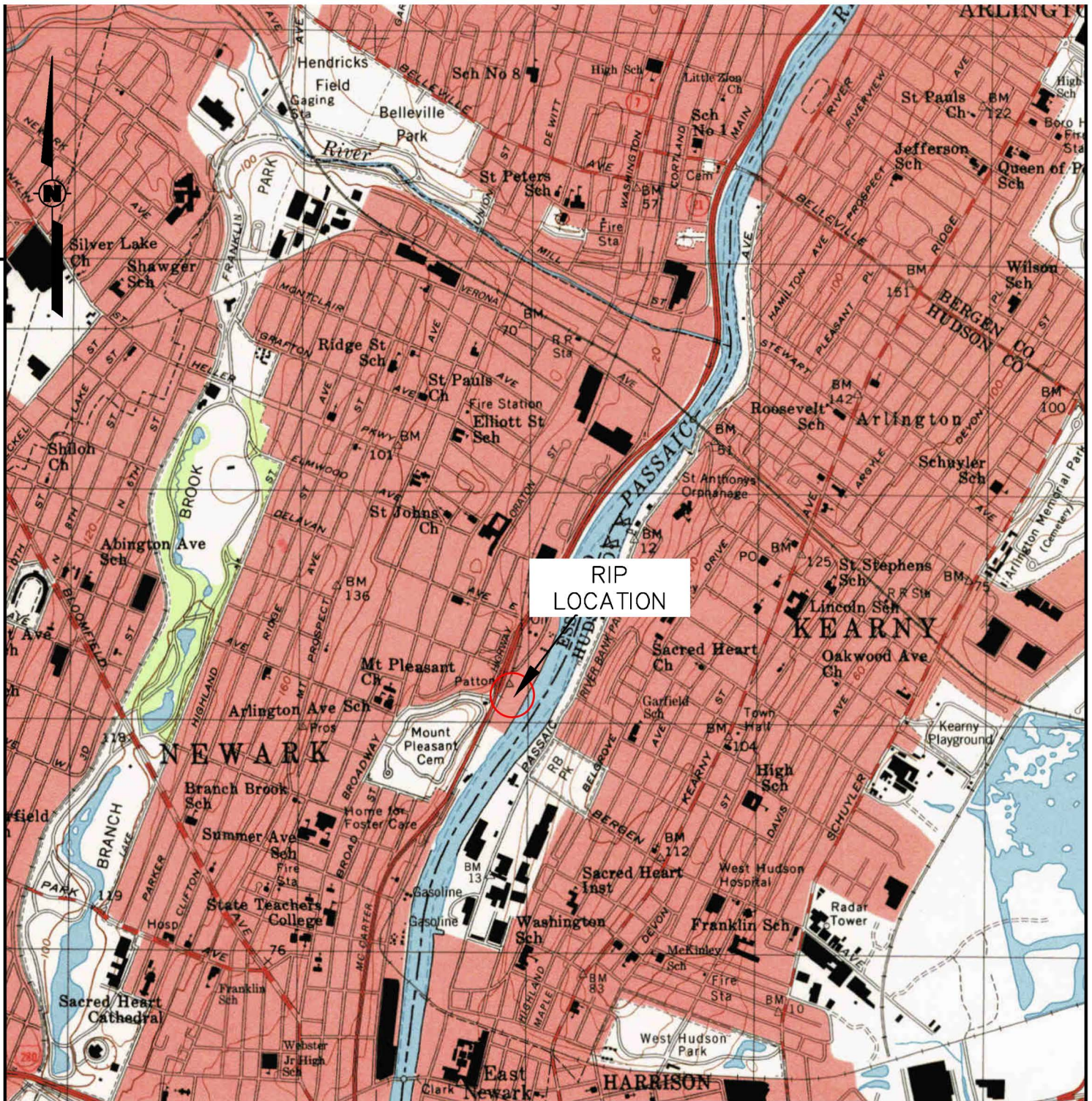
Table 8-10
Sedimentation Depths
Lower Passaic River
Riverside Industrial Park
Newark, New Jersey

Sample Location⁽¹⁾	1963 Depth⁽²⁾ feet	Projected 1971 Depth⁽³⁾ feet
10A	2.1	1.5
75A	3.1	2.5
90A	4.8	4.2

Notes:

1. Figure 8-6 displays location. As noted in Table 8-8, Sample Location 76A did not have a 1963 Cs-137 peak. Cs-137 concentrations at this location were non detect or slightly above detection limit.
2. Based upon highest Cs-137 concentration at this location
3. Based upon 2 cm/year sedimentation rate

FIGURES



SCALE

0 2000 4000 FEET

NEW JERSEY



QUADRANGLE
LOCATION

REFERENCE:

USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE;
ORANGE, NEW JERSEY, 1995.

FIGURE 1-1

RIP LOCATION MAP

RIVERSIDE INDUSTRIAL PARK
NEWARK, NEW JERSEY



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COMMITMENT & INTEGRITY DRIVE RESULTS

DRAWING NUMBER

13620A1

DRAWN BY: D.J. Martino

DATE: 06-18-14

CHECKED BY: B.T. Zewe

DATE: 07-08-14

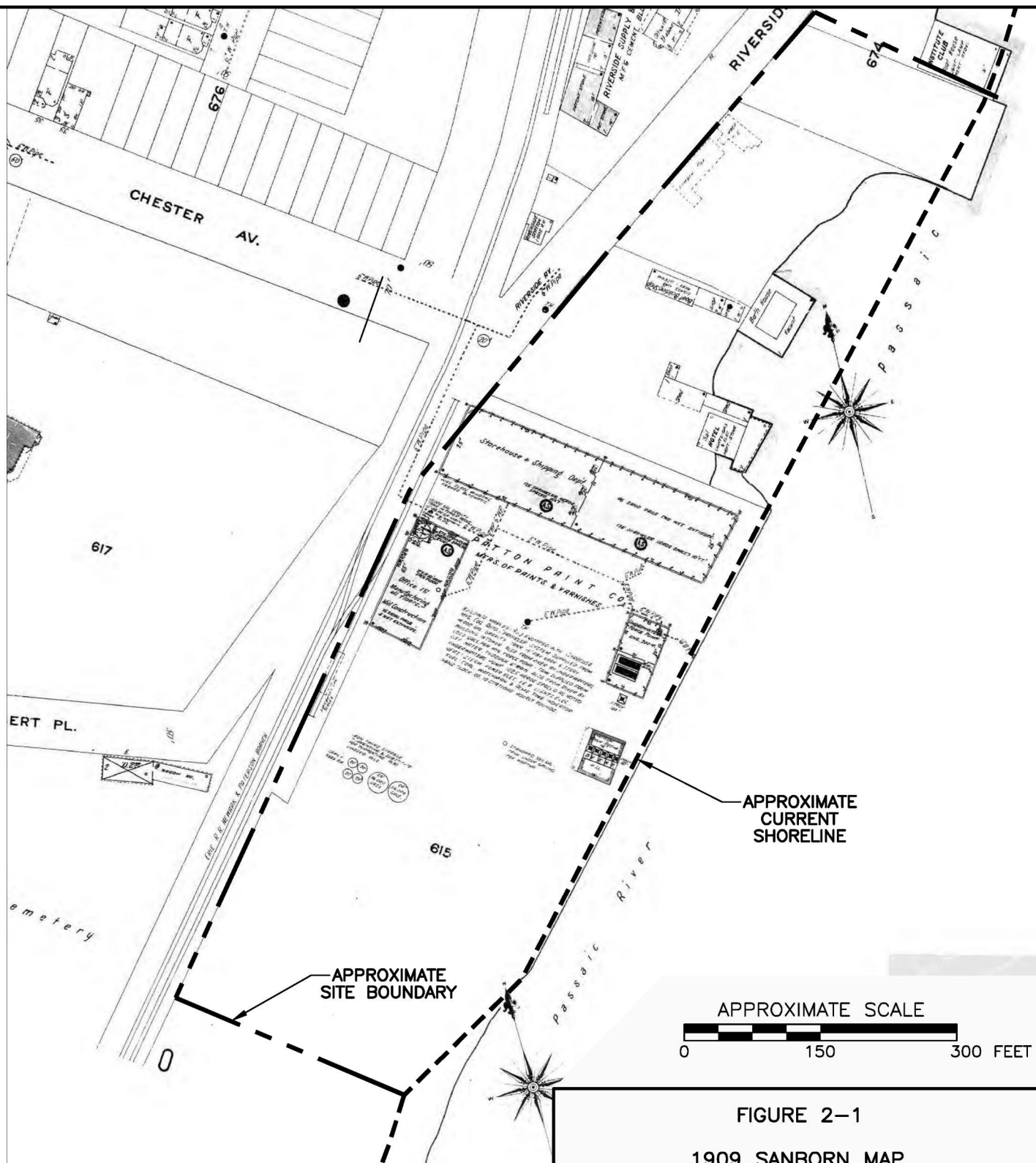


FIGURE 2-1

1909 SANBORN MAP

RIVERSIDE INDUSTRIAL PARK
NEWARK, NEW JERSEY

REFERENCE:
EDR CERTIFIED SANBORN MAP REPORT,
INQUIREY 3940448.3, MAY 12, 2014



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COMMITMENT & INTEGRITY DRIVE RESULTS

DRAWING NUMBER
13620A2

			DRAWN BY: D.J. Martino	DATE: 06-18-14
			CHECKED BY: B.T. Zewe	DATE: 07-08-14
REVISION	DATE	DESCRIPTION	APPROVED BY: K.J. Bird	DATE: 07-08-14



BLOCK 614 LOT #	BUILDING #	OWNER
1	2,3	HATZLUCHA
57	10	PLAGRO REALTY
58	15, 15A	CITY OF NEWARK
59	14	ALBERT SHARPHOUSE
60	1	SHEFAH IN NEWARK, LLC.
61	6	CITY OF NEWARK
62	9	CELCOR ASSOC.,LLC.
63	7	CITY OF NEWARK
64	12	CITY OF NEWARK
65	NA	INDUSTRIAL DEV. CO.
66	17	CHEMICAL COMPOUNDS, INC
67	NA	CELCOR ASSOC.,LLC.
68	NA	CITY OF NEWARK
69	13, 19	SHARPMORE HOLDING CO.
70	16	CAROL GRAIFMAN

LEGEND

- - - APPROXIMATE SITE BOUNDARY
- APPROXIMATE LOT BOUNDARY
- 61 LOT NUMBER
- #17 BUILDING NUMBER

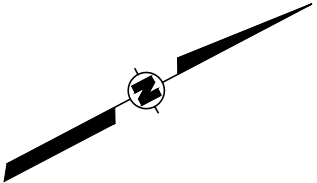



FIGURE 2-2
PARCEL AND BUILDING LOCATION MAP
RIVERSIDE INDUSTRIAL PARK
NEWARK, NEW JERSEY

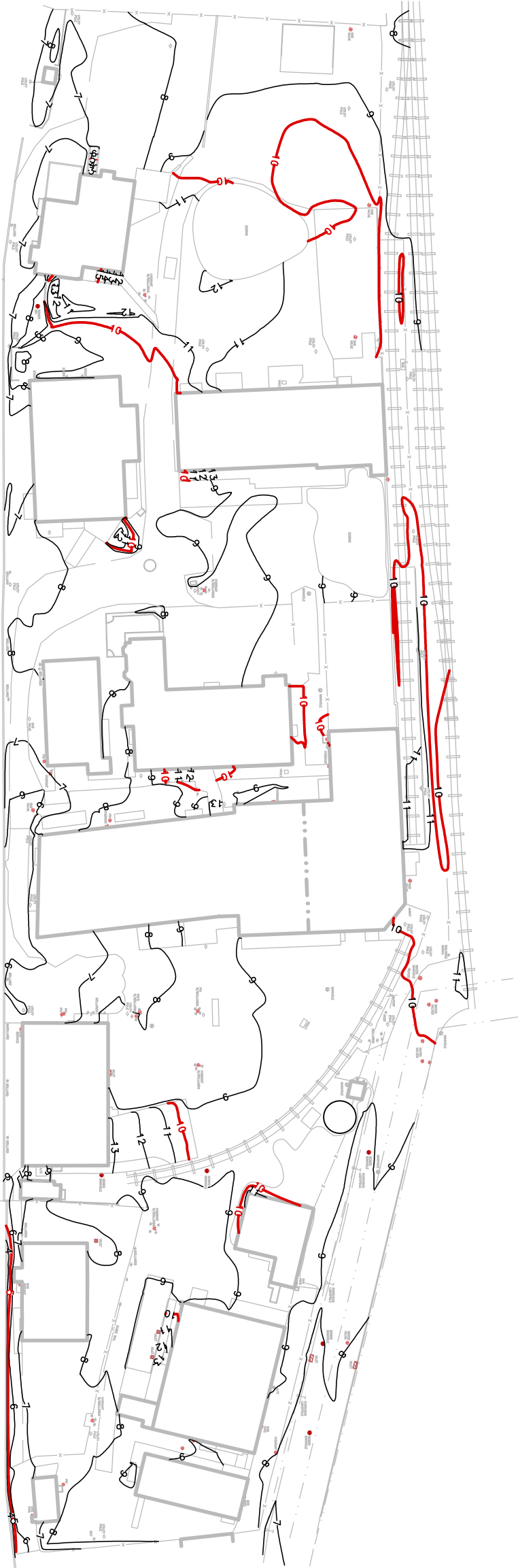
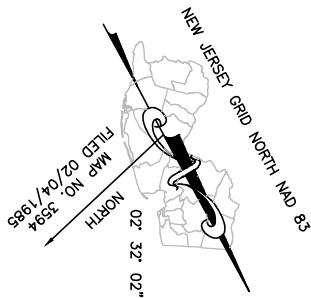


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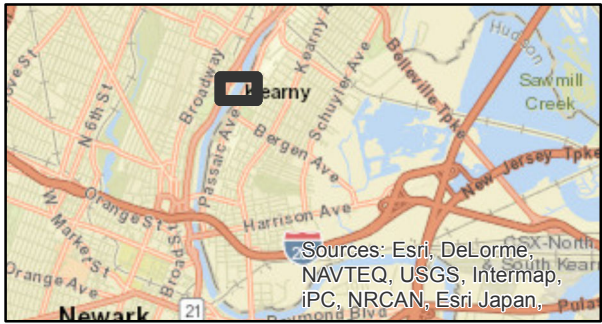
DRAWING NUMBER
11602B2

#1	6/28/16	Add Building Numbers	DRAWN BY: T.N. Fitzroy	DATE: 3/24/14
			CHECKED BY: B.T. Zewe	DATE: 07/08/14
REVISION	DATE	DESCRIPTION	APPROVED BY: K.J. Bird	DATE: 07/08/14





Source: Esri, DigitalGlobe, GeoEye, I-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, P...

Legend

● Soil Sample Location — RIP Boundary

Notes:
Soil Sample Locations for PCBs, Pesticides, or Mercury

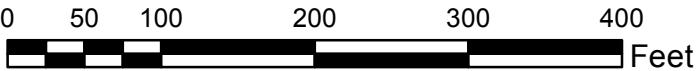


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COMMITMENT & INTEGRITY DRIVE RESULTS

Data Sources: Site Characterization Summary Report, RIP Superfund Site

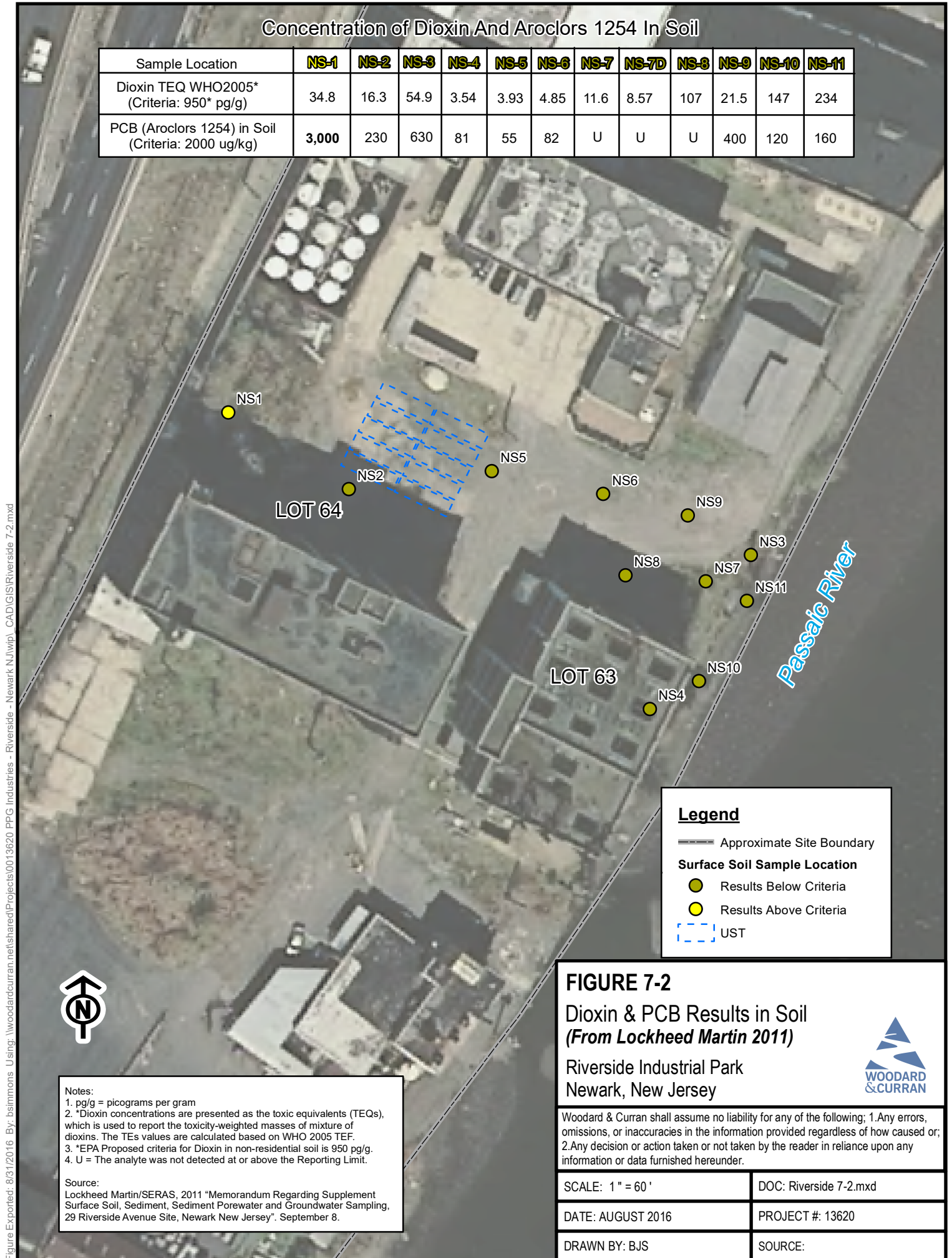
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DATE: August 2016	DOC: Fig7-1_Soil_Sample_Locations
	JOB NO.: 13620

Figure 7-1
Soil Sample Locations
Riverside Industrial Park



Concentration of Dioxin And Aroclors 1254 In Soil

Sample Location	NS-1	NS-2	NS-3	NS-4	NS-5	NS-6	NS-7	NS-7D	NS-8	NS-9	NS-10	NS-11
Dioxin TEQ WHO2005* (Criteria: 950* pg/g)	34.8	16.3	54.9	3.54	3.93	4.85	11.6	8.57	107	21.5	147	234
PCB (Aroclors 1254) in Soil (Criteria: 2000 ug/kg)	3,000	230	630	81	55	82	U	U	U	400	120	160



Notes:

1. pg/g = picograms per gram
2. *Dioxin concentrations are presented as the toxic equivalents (TEQs), which is used to report the toxicity-weighted masses of mixture of dioxins. The TE values are calculated based on WHO 2005 TEF.
3. *EPA Proposed criteria for Dioxin in non-residential soil is 950 pg/g.
4. U = The analyte was not detected at or above the Reporting Limit.

Source:

Lockheed Martin/SERAS, 2011 "Memorandum Regarding Supplement Surface Soil, Sediment, Sediment Porewater and Groundwater Sampling, 29 Riverside Avenue Site, Newark New Jersey". September 8.

FIGURE 7-2

Dioxin & PCB Results in Soil (From Lockheed Martin 2011)

Riverside Industrial Park
Newark, New Jersey



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SCALE: 1" = 60'

DOC: Riverside 7-2.mxd

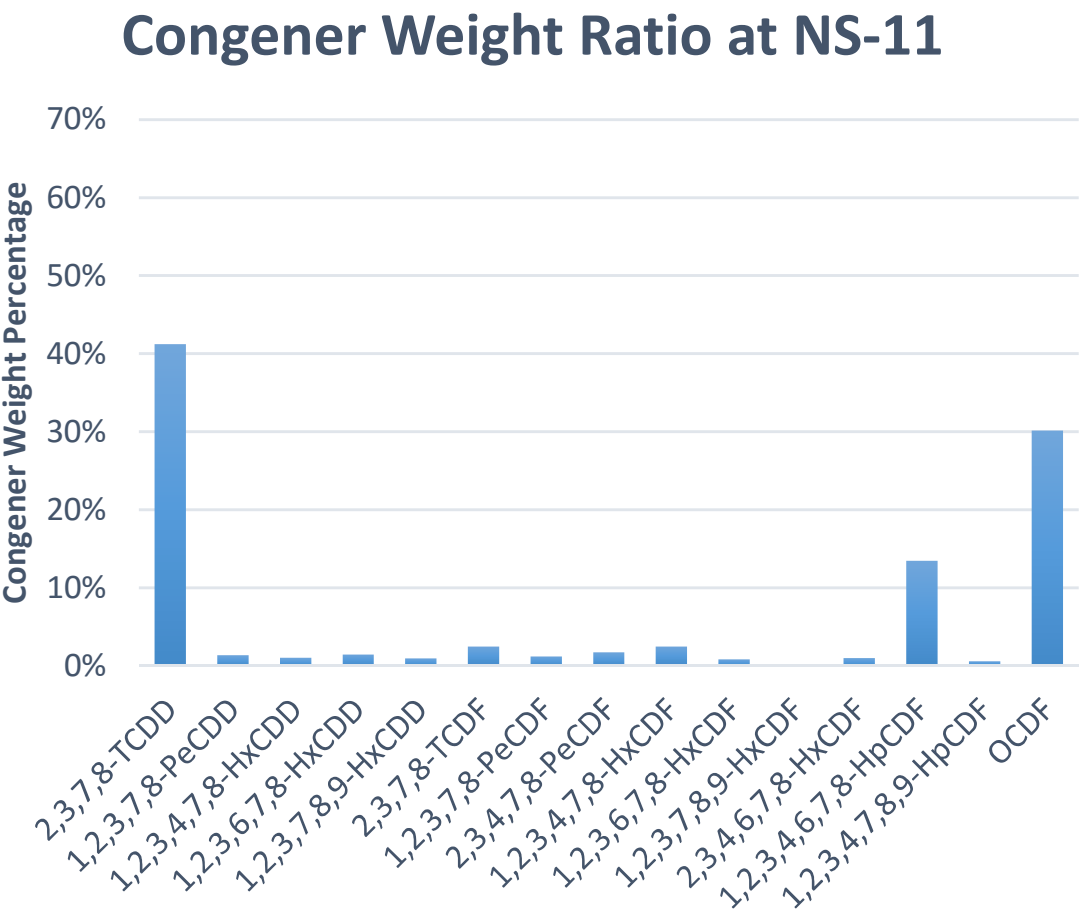
DATE: AUGUST 2016

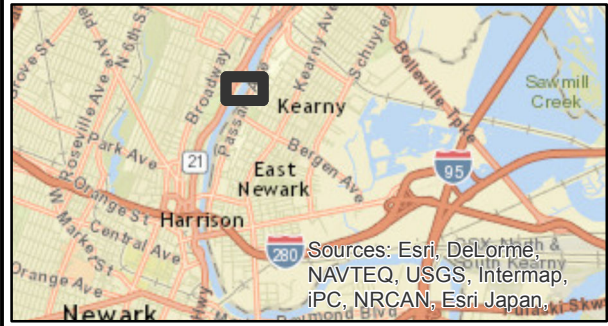
PROJECT #: 13620

DRAWN BY: BJS

SOURCE:

Figure 7-3
Congener Weight Ratio
Riverside Industrial Park
Superfund Site
Newark, New Jersey





Legend

● PCB Exceedance

● Sample Location for PCB

— RIP Boundary

Notes:

1. Soil result exceedances based on EPA RSLs for Industrial Soil (Aroclor-1254: 0.97 mg/kg, Aroclor-1260: 0.99 mg/kg, Total PCBs: 0.94 mg/kg)

2. Lot 70 results are prior to soil removal action performed by responsible party

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COMMITMENT & INTEGRITY DRIVE RESULTS

Data Sources: Site Characterization Summary Report, RIP Superfund Site

DRAWN BY: EEC	SCALE:
DATE: August 2016	DOC: Fig7-4_PCB_Soil_Results_RIP
	JOB NO.: 13620

Figure 7-4

PCB Soil Results (mg/kg)

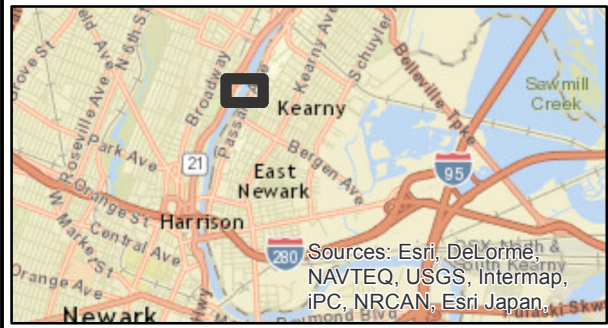
Riverside Industrial Park

0 50 100 200 300 400

Feet



Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



Legend

● PCB Exceedance — RIP Boundary

● Sample Location for PCB

Notes:

1. Soil result exceedances based on EPA RSLs for Industrial Soil
(Aroclor-1254: 0.97 mg/kg, Aroclor-1260: 0.99 mg/kg, Total PCBs: 0.94 mg/kg)

2. Lot 70 results are prior to soil removal action performed by responsible party

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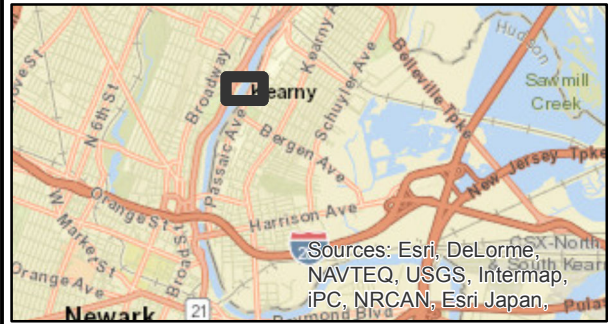
Data Sources: Site Characterization Summary Report, RIP Superfund Site


DRAWN BY: EEC	SCALE:
DATE: August 2016	DOC: Fig7-4_PCB_Soil_Results_Lot70
	JOB NO.: 13620

Figure 7-5

PCB Soil Results (mg/kg) - Lot 70
Riverside Industrial Park

0 25 50 100 150 200 Feet





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COMMITMENT & INTEGRITY DRIVE RESULTS

Data Sources: Site Characterization Summary Report, RIP Superfund Site

DRAWN BY: EEC	SCALE:
DATE: August 2016	DOC: Fig7-6_PCB_Soil_Results_Post-Remediation
	JOB NO.: 13620

Figure 7-6

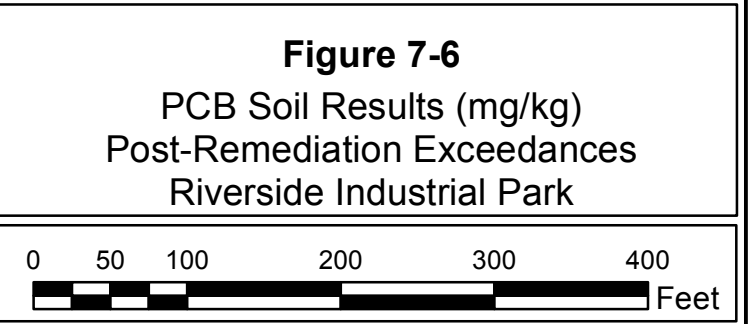
PCB Soil Results (mg/kg)

Post-Remediation Exceedances

Riverside Industrial Park

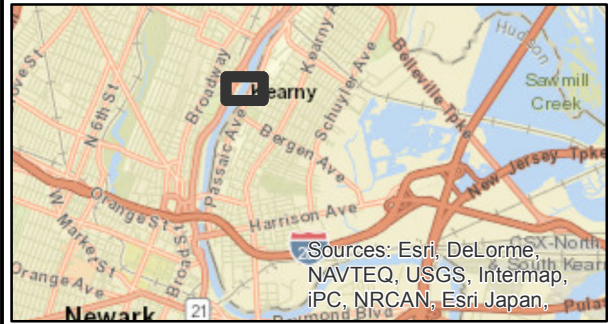
050100200300400

Feet





Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



Legend

- Hg Exceedance
- Sample Location for Hg
- RIP Boundary

Notes:

1. Soil result exceedances based on EPA RSLs for Industrial Soil (Mercury: 4.6 mg/kg)

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COMMITMENT & INTEGRITY DRIVE RESULTS

Data Sources: Site Characterization Summary Report, RIP Superfund Site

DRAWN BY: EEC	SCALE:
DATE: August 2016	DOC: Fig7-7_Hg_Soil_Results_RIP
	JOB NO.: 13620

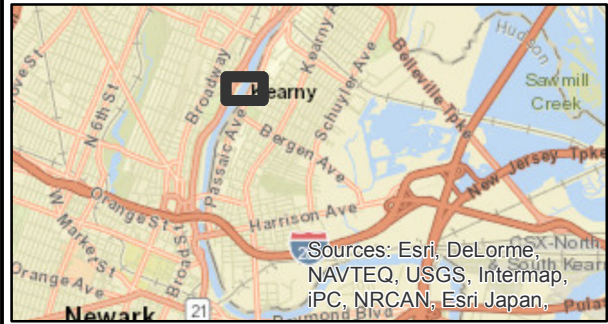
Figure 7-7

Mercury Soil Results (mg/kg)
Riverside Industrial Park

0 50 100 200 300 400 Feet



Source: Esri, DigitalGlobe, GeoEye, I-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, Pular

Legend

- Pesticide Exceedance (None)
- Sample Location for Pesticide
- RIP Boundary

Notes:
1. Soil result exceedances based on EPA RSLs for Industrial Soil (No exceedances)



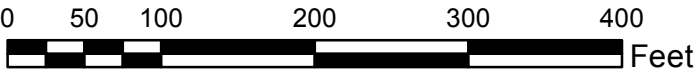
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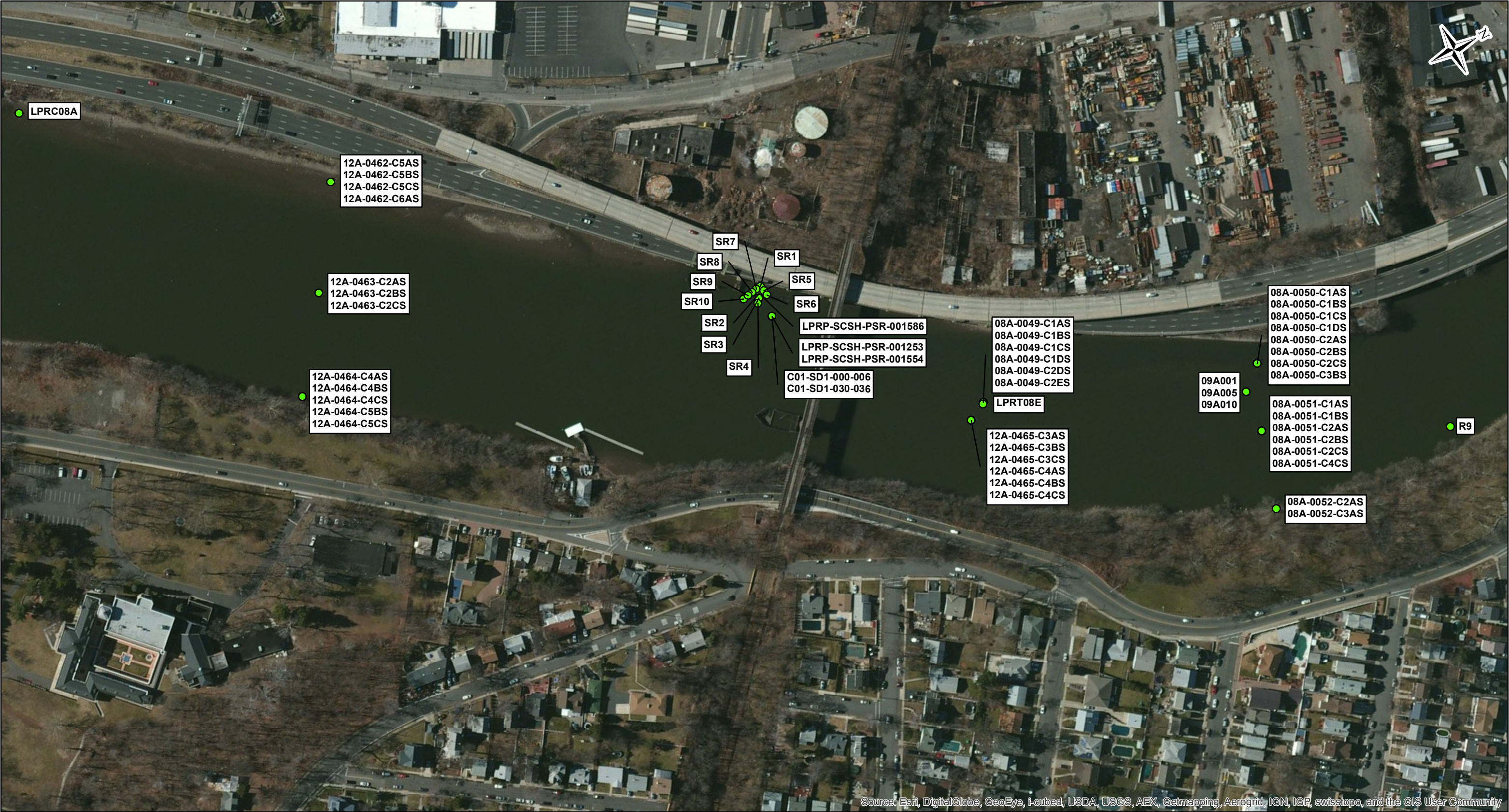
Data Sources: Site Characterization Summary Report, RIP Superfund Site

DRAWN BY: EEC	SCALE:
DATE: August 2016	DOC: Fig7-8_PEST_Soil_Results_RIP
	JOB NO.: 13620

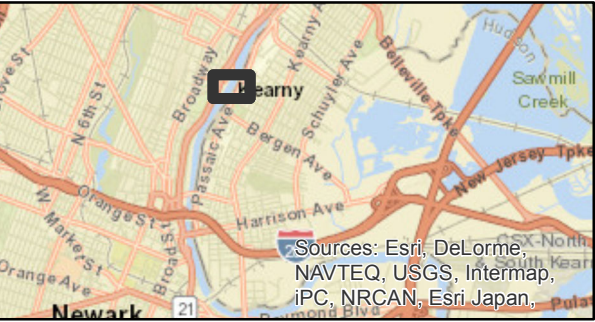
Figure 7-8

Pesticide Soil Results (mg/kg)
Riverside Industrial Park





Source: Esri, DigitalGlobe, GeoEye, I-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, IPC, NRCAN, Esri Japan, and the GIS User Community

Legend

● Sediment Locations

Notes:
Locations assigned to this region are based upon river mile listed in database.

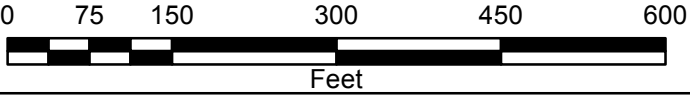


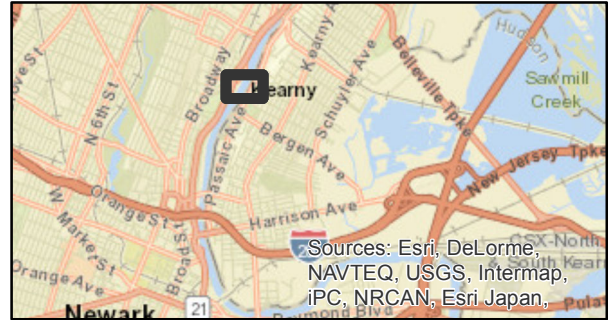
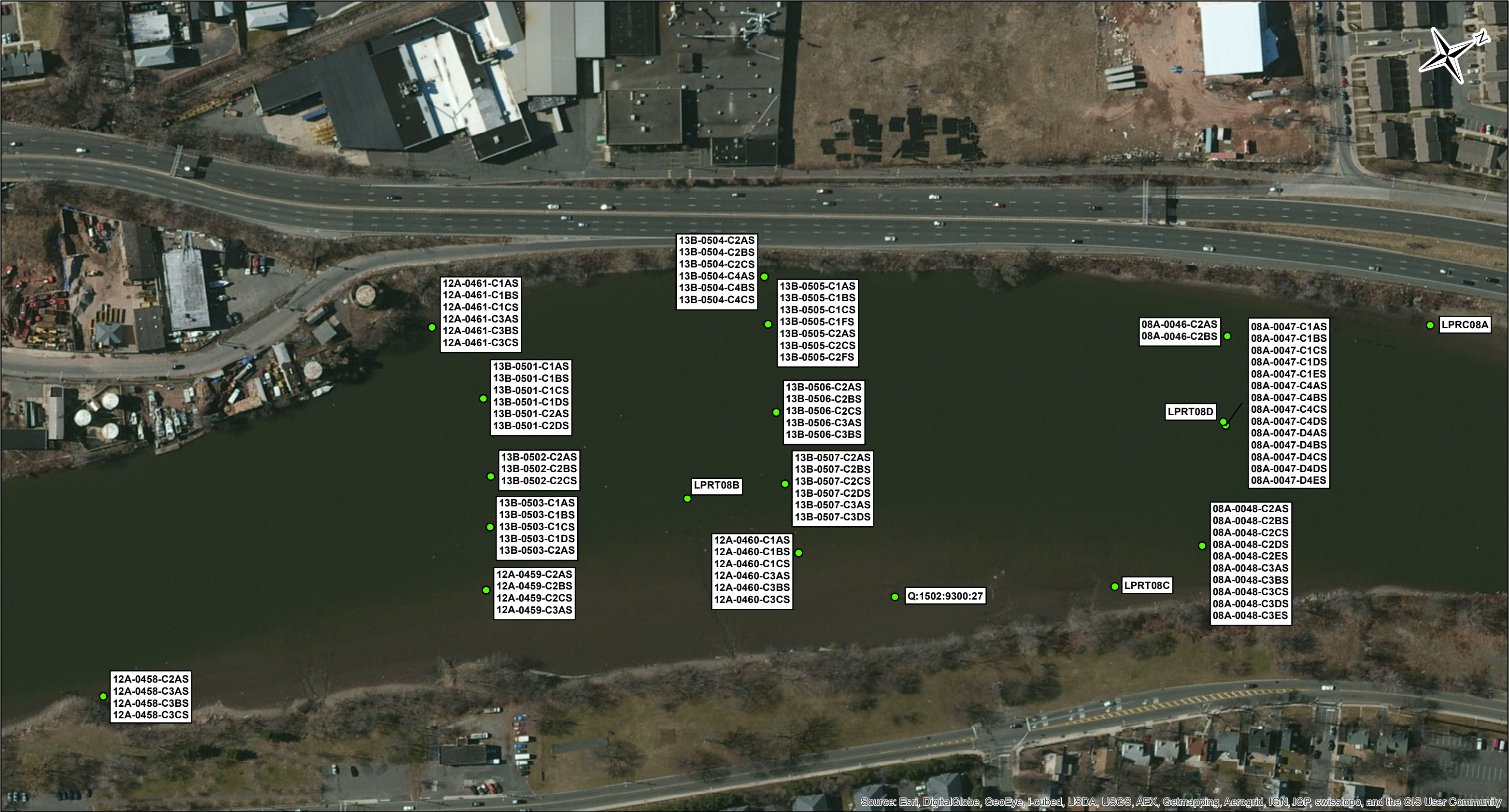
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COMMITMENT & INTEGRITY DRIVE RESULTS

Data Sources:

DRAWN BY: EEC	SCALE:
DATE: August 2016	DOC: Fig8-1_UpRiver7.55-8.05
	JOB NO.: 13620

Figure 8-1
Sediment Locations
Up-River Region | River Mile 7.55-8.05
Lower Passaic River





Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan,...

Legend

● Sediment Locations

Notes:
Locations assigned to this region are based upon river mile listed in database.

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Data Sources:

DRAWN BY: EEC	SCALE:
DATE: August 2016	DOC: Fig8-2_UpRiver7.05-7.55
	JOB NO.: 13620

Figure 8-2

Sediment Locations

Up-River Region | River Mile 7.05-7.55

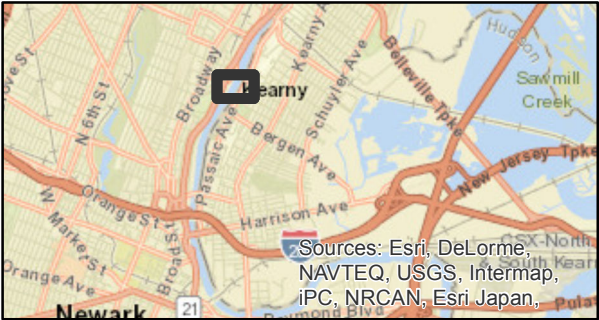
Lower Passaic River

0 125 250 375 500

Feet



Source: Esri, DigitalGlobe, GeoEye, I-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, IPC, NRCAN, Esri Japan,...

Legend

Sediment Locations

RIP Boundary

Notes:

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Data Sources:

DRAWN BY: EEC

DATE: August 2016

SCALE:

DOC: Fig8-3_RIPAdjacent6.80-7.05

JOB NO.: 13620

Figure 8-3

Sediment Locations

RIP-Adjacent Region | River Mile 6.80-7.05

Lower Passaic River

0

75

150

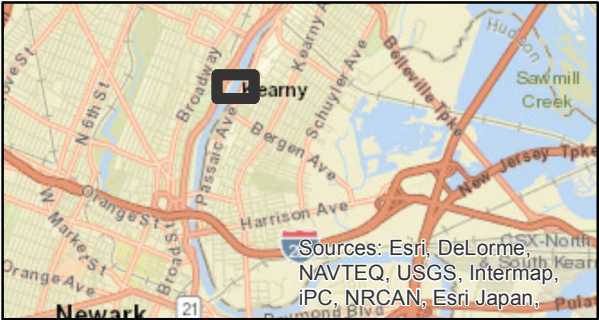
225

300

Feet



Source: Esri, DigitalGlobe, GeoEye, I-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan,

Legend

● Sediment Locations

Notes:
Locations assigned to this region are based upon river mile listed in database.

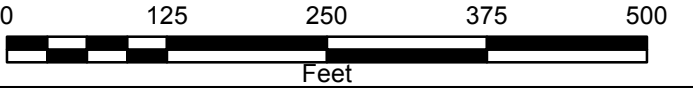


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Data Sources:

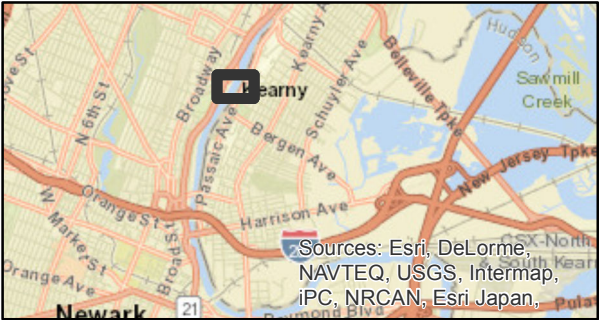
DRAWN BY: EEC	SCALE:
DATE: August 2016	DOC: Fig8-5_DownRiver_5.80-6.30
	JOB NO.: 13620

Figure 8-5
Sediment Locations
Down-River Region | River Mile 5.80-6.30
Lower Passaic River





Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



Legend

Sediment Core Locations

RIP Boundary

Notes:

Sediment core samples collected by Tierra Solutions, Inc. (TSI)

10A-TSI: 1991

75A-TSI, 76A-TSI & 90A-TSI: 1993

276-TSI, 277-TSI, & 278-TSI: 1995

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Data Sources:

DRAWN BY: EEC	SCALE:
DATE: August 2016	DOC: Fig8-6_Sediment_Core_Locations
	JOB NO.: 13620

Figure 8-6

Sediment Core Locations
with Cesium-137 & 2,3,7,8-TCDD Results
Lower Passaic River
Riverside Industrial Park

0

50

100

200

300

400

Feet

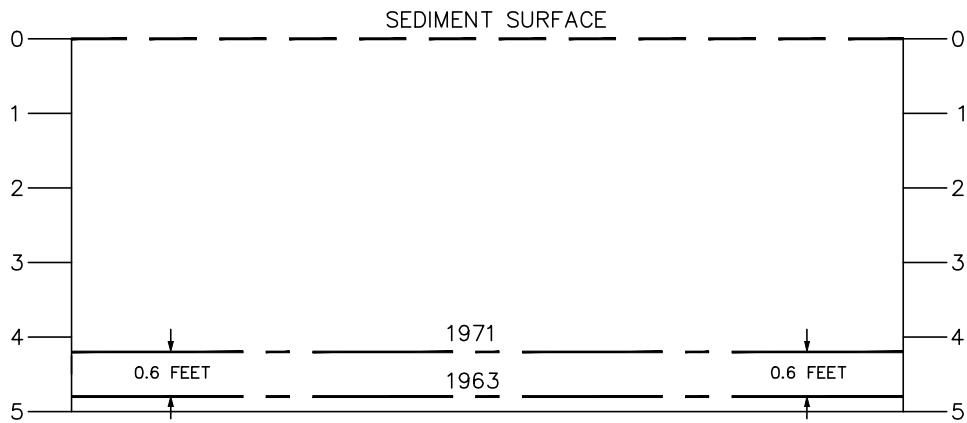
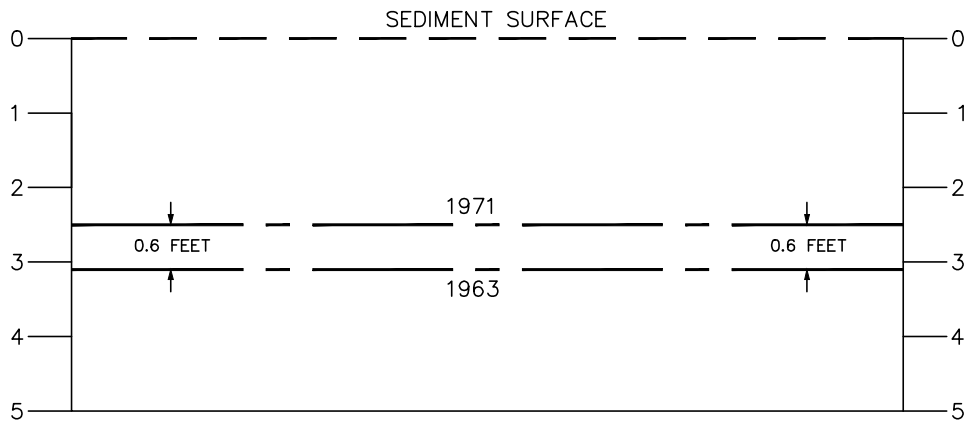
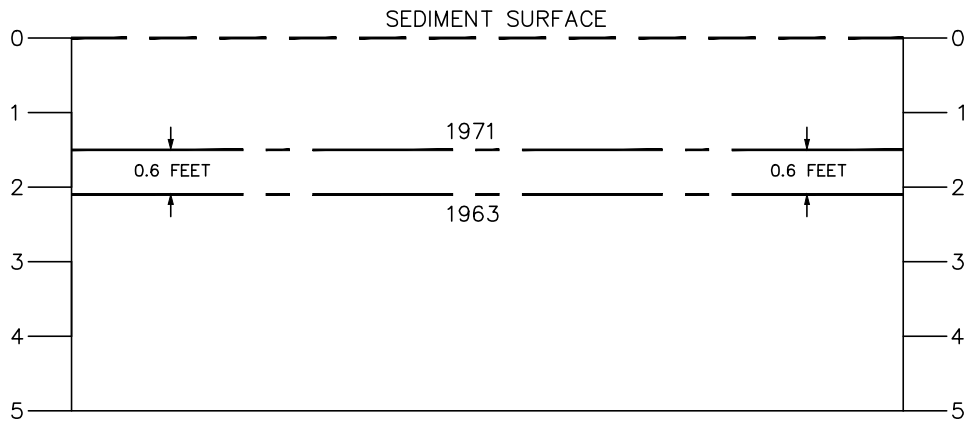


FIGURE 8-7

SEDIMENT HORIZONS

RIVERSIDE INDUSTRIAL PARK
NEWARK, NEW JERSEY



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DRAWING NUMBER
13620A3

			DRAWN BY: <i>B.J. Simmons</i>	DATE: <i>09-08-16</i>
			CHECKED BY: <i>B.T. Zewe</i>	DATE: <i>09-08-16</i>
REVISION	DATE	DESCRIPTION	APPROVED BY: <i>K.J. Bird</i>	DATE: <i>09-08-16</i>

APPENDIX A: 1989 PA JOBAR AND 1992 RCRA ASSESSMENT

SA-115

02-8905-03-PA
REV. NO. 0

FINAL DRAFT
PRELIMINARY ASSESSMENT
JOBAR PACKAGING, INC.
NEWARK, NEW JERSEY

PREPARED UNDER

TECHNICAL DIRECTIVE DOCUMENT NO. 02-8905-03
CONTRACT NO. 68-01-7346

FOR THE

ENVIRONMENTAL SERVICES DIVISION
U.S. ENVIRONMENTAL PROTECTION AGENCY

JULY 18, 1989

NUS CORPORATION
SUPERFUND DIVISION

SUBMITTED BY:

Joann L. Wagner
JOANN L. WAGNER
PROJECT MANAGER

Anderson
SON

REVIEWED/APPROVED BY:

Charles H. Bae (AF-1001) / for
RONALD M. NAMAN
FACILITY OFFICE MANAGER

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT

PART I: SITE INFORMATION

1. Site Name/Alias Jobar Packaging, Inc.*
Street 29 Riverside Ave. Building 7
City Newark State New Jersey Zip 07104
2. County Essex County Code 13 Cong. Dist. 10
3. EPA ID No. NJD000729780
4. Latitude 40° 45' 45" N Longitude 74° 09' 40" W
USGS Quad. Orange, New Jersey
5. Owner Jobar Packaging, Inc.* Tel. No. (215) 598-7141
Street 270 Street Road
City New Hope State PA Zip 18938
6. Operator Jobar Packaging, Inc.* Tel. No. (215) 598-7141
Street 270 Street Road
City New Hope State PA Zip 18938
7. Type of Ownership
☒ Private ☐ Federal ☐ State
☐ County ☐ Municipal ☐ Unknown ☐ Other _____
8. Owner/Operator Notification on File
☒ RCRA 3010 Date 8/18/80 ☐ CERCLA 103c Date _____
☐ None ☐ Unknown
9. Permit Information
- | Permit | Permit No. | Date Issued | Expiration Date | Comments |
|-----------------------------|---------------|----------------|-----------------|----------------------|
| <u>Air Pollution Permit</u> | <u>81-236</u> | <u>Unknown</u> | <u>Unknown</u> | <u>Fume Scrubber</u> |
| <u>Air Pollution Permit</u> | <u>81-237</u> | <u>Unknown</u> | <u>Unknown</u> | <u>Steam Boiler</u> |

* Site is currently operated by Frey Industries, Inc. and owned by Industrial Development Association

10. Site Status

☒ Active

☐ Inactive

☐ Unknown

11. Years of Operation November 1, 1979 to October 31, 1982*

12. Identify the types of waste units (e.g., landfill, surface impoundment, piles, stained soil, above- or below-ground tanks or containers, land treatment, etc.) on site. Initiate as many waste unit numbers as needed to identify all waste sources on site.

(a) Waste Management Areas

Waste Unit No.	Waste Unit Type	Facility Name for Unit
1	<u>Underground Tank</u>	<u>Underground 100,000-Gallon Tank</u>
2	<u>Contaminated Soil</u>	<u>Contaminated Soil</u>
3	<u>Indoor Containers</u>	<u>Building 7</u>

(b) Other Areas of Concern

Identify any miscellaneous spills, dumping, etc. on site; describe the materials and identify their locations on site.

There were no known incidents of miscellaneous spills, dumping, etc. on site attributed to Jobar Packaging, Inc.; however, the current operator, Frey Industries, Inc., had an incident on site on September 16, 1987. An estimated 25 pounds of perchloroethylene was released to the ground from a leaking valve on a tank trailer. Also on site at the time of this incident were truck trailers filled with drums that had previously contained acetyl chloride, and a trailer containing approximately 40 boxes of jars of unknown liquid contents. The boxes were labelled "dispose of by May 1986", and some of the material appeared to be a petroleum product. Also, a 1987 RCRA Inspection Report noted that the facility was not classifying spilled materials from packaging and repackaging of raw materials as a hazardous waste; however, as a result of the inspection, the spilled materials (floor sweepings) were classified as hazardous waste.

13. Information available from

Contact Amy Brochu Agency U.S. EPA Tel. No. (201) 906-6802

Preparer Susan Anderson Agency NUS Corp. Region 2 FIT Date July 18, 1989

* Years of operation under Jobar Packaging, Inc. Site is currently operated by Frey Industries, Inc.

PART II: WASTE SOURCE INFORMATION

For each of the waste units identified in Part I, complete the following six items.

Waste Unit 1 - Underground Tank, Underground 100,000-Gallon Tank

1. Identify the RCRA status and permit history, if applicable, and the age of the waste unit.

Jobar Packaging, Inc. filed a notification of hazardous waste activity on August 14, 1980; the company was listed as a Treatment, Storage, or Disposal facility. The facility declared insolvency on October 31, 1982, and on August 10, 1983, Frey Industries, Inc. informed the New Jersey Department of Environmental Protection (NJDEP) that it had purchased the assets of Jobar Packaging, Inc. Frey Industries is currently classified as a Treatment, Storage, or Disposal (TSD) facility. Jobar Packaging, Inc. used the concrete underground tank to collect filling line washings generated from the flushing of pipes or hoses used to transfer material from bulk storage containers to drums. Frey Industries, Inc. reported on September 7, 1984, that it had discontinued use of the underground concrete tank to collect filling line washings, and that any future line washings would be collected in a 55-gallon drum. Frey Industries requested delisting from a TSD facility to a generator only in October 1984. Frey Industries submitted a closure plan dated November 26, 1984 for the underground tank, but the NJDEP found it to be deficient, as the plan did not include a sampling plan for the underground tank and did not address the tanks in Building 7. The NJDEP issued an Administrative Order and Notice of Civil Administrative Penalty Assessment on March 19, 1987, because a proper closure plan had not yet been submitted. Analyses of samples believed to have been taken from the underground tank and surrounding soil showed the presence of petroleum hydrocarbons above NJDEP limits in one sample, and of trans-1,2-dichloroethene in another. An NJDEP memo dated March 28, 1988, indicates that at that time formal closure had not been completed.

2. Describe the location of the waste unit and identify clearly on the site map.

The concrete underground tank is located below Building 7. Building 7 is located at the southeast section of the property near the Passaic River.

3. Identify the size or quantity of the waste unit (e.g., area or volume of a landfill or surface impoundment, number and capacity of drums or tanks). Specify the quantity of hazardous substances in the waste unit.

The capacity of the underground tank was reported to be 100,000 gallons. A 1982 RCRA Generator Inspection Form for Jobar Packaging Inc. reported that the quantity of hazardous substances contained in this waste unit was 2,000 gallons. The NJDEP reported that on October 1, 1984, there was approximately 6 inches of hazardous waste in the underground tank.

4. Identify the physical state(s) of the waste type(s) as disposed of in the waste unit. The physical state(s) should be categorized as follows: solid, powder or fines, sludge, slurry, liquid, or gas.

The 1982 RCRA Inspection Form for Jobar Packaging Inc. reported that the physical state of the waste as disposed of in the underground tank was liquid. The NJDEP reported that on October 1, 1984, the physical state of the waste in the tank was liquid and sludge.

5. Identify specific hazardous substance(s) known or suspected to be present in the waste unit.

The 1982 RCRA Inspection Form for Jobar Packaging, Inc. reported that the underground tank contained water and acid blends. The NJDEP reported that on October 1, 1984, the waste in the underground tank had a strong odor of chlorinated organic chemicals.

6. Describe the containment of the waste unit as it relates to contaminant migration via groundwater, surface water, and air.

The 1982 RCRA Inspection Form for Jobar Packaging Inc. reported that the underground tank was in sound condition. A 1987 RCRA inspection report for Frey Industries, Inc. did not provide an evaluation of the concrete tank.

Ref. Nos. 1, 2, 3, 4, 10, 12, 14, 16, 17, 18, 19, 20, 26, 27, 29, 30

PART II: WASTE SOURCE INFORMATION

For each of the waste units identified in Part I, complete the following six items.

Waste Unit 2 - Contaminated Soil, Contaminated Soil

1. Identify the RCRA status and permit history, if applicable, and the age of the waste unit.

Frey Industries, Inc. is listed as a Treatment, Storage, or Disposal (TSD) facility. A 1987 RCRA inspection report indicated that there was a dark stained area on site. An unpaved area was "apparently" contaminated with chemicals that dripped from pipes and hoses that were used to fill drums. Soil samples were to have been collected from this area and analyzed for potential contamination. It is not known whether any samples were ever collected or what the analytical results were. If contamination was detected, Frey Industries was to have incorporated cleanup and removal of the soil into the closure plan requested in the March 19, 1987 Administrative Order.

2. Describe the location of the waste unit and identify clearly on the site map.

The contaminated soil was located at the entrance to Building 7.

3. Identify the size or quantity of the waste unit (e.g., area or volume of a landfill or surface impoundment, number and capacity of drums or tanks). Specify the quantity of hazardous substances in the waste unit.

The quantity of the waste unit is unknown.

4. Identify the physical state(s) of the waste type(s) as disposed of in the waste unit. The physical state(s) should be categorized as follows: solid, powder or fines, sludge, slurry, liquid, or gas.

The physical state of the waste as disposed of is liquid.

5. Identify specific hazardous substance(s) known or suspected to be present in the waste unit.

The specific hazardous substances present in the soil are unknown. Products handled at Frey Industries include polyester resins, flammable liquids, acids, bases, corrosives, and poisons.

6. Describe the containment of the waste unit as it relates to contaminant migration via groundwater, surface water, and air.

The waste unit area was unpaved.

Ref. Nos. 1, 8, 9, 10, 11

PART II: WASTE SOURCE INFORMATION

For each of the waste units identified in Part I, complete the following six items.

Waste Unit 3 - Indoor Containers, Building 7

1. Identify the RCRA status and permit history, if applicable, and the age of the waste unit.

Prior to Jobar Packaging, Inc.'s ownership of the property, Pittsburgh Plate Glass owned the facility until foreclosure on September 30, 1977. Jobar Packaging operated at this site from November 1979 to October 1982, after which it sold its assets to Frey Industries, Inc. The age of Building 7 is unknown; a U.S. Geological Survey report indicates that Pittsburgh Plate Glass was in existence in 1940. A closure plan addressing proper closure of the tanks in Building 7 was requested in an Administrative Order and Notice of Civil Administrative Penalty Assessment issued by the NJDEP on March 19, 1987.

2. Describe the location of the waste unit and identify clearly on the site map.

Building 7 is located on the southeastern portion of the site near the Passaic River.

3. Identify the size or quantity of the waste unit (e.g., area or volume of a landfill or surface impoundment, number and capacity of drums or tanks). Specify the quantity of hazardous substances in the waste unit.

During an October 1, 1984 NJDEP inspection, it was determined that Building 7 housed five 3,000-gallon tanks, five 1,500-gallon tanks, and seventy-two 2,000-gallon tanks. Also housed within this building were an unknown number of cardboard barrels with small lab-type bottles, and an unknown number of steel drums.

4. Identify the physical state(s) of the waste type(s) as disposed of in the waste unit. The physical state(s) should be categorized as follows: solid, powder or fines, sludge, slurry, liquid, or gas.

The physical state of the waste as disposed of in the lab-type bottles and in the various sized tanks is unknown; however, it is assumed that the cardboard barrels contained liquid because they were wet. The steel drums contained powders.

5. Identify specific hazardous substance(s) known or suspected to be present in the waste unit.

The specific hazardous substances in the lab-type bottles, the 3,000-gallon tanks, the 1,500-gallon tanks, and the 2,000-gallon tanks are unknown; however, it was reported that the five 1,500-gallon tanks were coated with a hard, varnishlike gum, and that the seventy-two 2,000-gallon tanks contained hardened, resinlike residues. The steel drums contained paraformaldehyde.

6. Describe the containment of the waste unit as it relates to contaminant migration via groundwater, surface water, and air.

There is little potential for contaminant migration via groundwater or surface water because the hazardous materials were stored on the second and third floors of Building 7; however, the rusted steel drums were open, and a label read "dust has potential to cause explosion when mixed with air, avoid dust/vapor, keep container closed".

Ref. Nos. 10, 12, 15, 27, 33, 46

PART III: HAZARD ASSESSMENT

GROUNDWATER ROUTE

1. **Describe the likelihood of a release of contaminant(s) to the groundwater as follows: observed, alleged, potential, or none. Identify the contaminant(s) detected or suspected, and provide a rationale for attributing the contaminant(s) to the facility.**

There is potential for a release of contaminants to the groundwater, as a 1987 RCRA inspection form reported that there was a dark stained area on site; an unpaved area was contaminated with chemicals that dripped from pipes and hoses used to fill drums. Soil samples were to have been taken from this area and analyzed for potential contamination, but it is not known whether this was ever accomplished. Although the underground tank is no longer used to collect filling line washings, it is unknown whether proper closure of the tank was ever completed.

Ref. Nos. 3, 10

2. **Describe the aquifer of concern; include information such as depth, thickness, geologic composition, permeability, overlying strata, confining layers, interconnections, discontinuities, depth to water table, groundwater flow direction.**

The aquifer of concern includes the Pleistocene deposits of stratified drift, composed of sand and gravel deposits, overlying and hydraulically connected to the Brunswick Formation. The Brunswick Formation is composed predominantly of interbedded brown, reddish-brown, and gray shale, sandy shale, sandstone, and some conglomerate. The approximate thickness of the aquifer, including the Pleistocene deposits, may be as much as 7,300 feet; the depth from the land surface to the top of the Brunswick Formation in the vicinity of the site is approximately 90 feet. The direction of groundwater flow is unknown; because of the various systems of fractures in the bedrock, groundwater is generally free to move in any direction. The depth to the water table is approximately 9 feet.

Ref. Nos. 20, 33, 34

3. **Is a designated sole source aquifer within 3 miles of the site?**

There are no sole source aquifers within 3 miles of the site.

Ref. Nos. 35, 36

4. **What is the depth from the lowest point of waste disposal/storage to the highest seasonal level of the saturated zone of the aquifer of concern?**

The depth of the underground tank is unknown; a depth of 6 feet will be assumed. The depth from the ground surface to the water table of the aquifer of concern is approximately 9 feet. Therefore, the depth from the lowest point of waste storage to the highest seasonal level of the aquifer of concern is approximately 3 feet.

Ref. Nos. 3, 20, 33

5. **What is the permeability value of the least permeable continuous intervening stratum between the ground surface and the aquifer of concern?**

The unsaturated zone consists of sand and gravel deposits. The permeability of these deposits is greater than 10^{-3} centimeters per second (cm/sec).

Ref. Nos. 33, 34

6. **What is the net annual precipitation for the area?**
Net annual precipitation is approximately 16 inches.
Ref. No. 37
7. **Identify uses of groundwater within 3 miles of the site (i.e., private drinking source, municipal source, commercial, industrial, irrigation, unusable).**
The use of groundwater within 3 miles of the site is for industrial and commercial purposes.
Ref. Nos. 5, 38, 39, 40, 41, 42
8. **What is the distance to and depth of the nearest well that is currently used for drinking or irrigation purposes?**
Groundwater is used for industrial and commercial purposes, and not as a source of drinking water within a 3-mile radius of the site.

Distance Not Applicable Depth Not Applicable
Ref. Nos. 5, 38, 39, 40, 41, 42
9. **Identify the population served by the aquifer of concern within a 3-mile radius of the site.**
Groundwater is used for industrial and commercial purposes, and not as a source of drinking water within a 3-mile radius of the site.
Ref. Nos. 5, 38, 39, 40, 41, 42

SURFACE WATER ROUTE

10. **Describe the likelihood of a release of contaminant(s) to surface water as follows: observed, alleged, potential, or none. Identify the contaminant(s) detected or suspected, and provide a rationale for attributing the contaminants to the facility.**

There is potential for a release of contaminants to surface water because it was reported that the soil outside of Building 7 was contaminated by unknown chemicals. Soil samples were to have been taken from this area and analyzed for potential contamination. It is not known whether any samples were ever actually collected from this area. A perchloroethylene leak from a tank truck also resulted in the contamination of soil on site; however, it is not known where on site this leak occurred. The site property is located within a 100-year floodplain.
Ref. Nos. 3, 10, 21, 22, 23, 24, 51
11. **Identify and locate the nearest downslope surface water. If possible, include a description of possible surface drainage patterns from the site.**
The Passaic River is adjacent to the site property.
Ref. No. 43
12. **What is the facility slope in percent? (Facility slope is measured from the highest point of deposited hazardous waste to the most downhill point of the waste area or to where contamination is detected.)**
The exact locations of the perchloroethylene release and the contaminated soil are unknown; therefore, the facility slope as defined above cannot be calculated. The site property is adjacent to the Passaic River.
Ref. Nos. 10, 21, 22, 23, 24, 43

13. **What is the slope of the intervening terrain in percent? (Intervening terrain slope is measured from the most downhill point of the waste area to the probable point of entry to surface water.)**

The exact location of the contaminated soil outside of Building 7 and the elevation of the Passaic River are unknown; therefore, the slope of the intervening terrain as defined cannot be calculated. The distance from the west side of Building 7 to the river is approximately 100 feet.

Ref. Nos. 1, 10, 43

14. **What is the 1-year 24-hour rainfall?**

The 1-year 24-hour rainfall is approximately 2.75 inches.

Ref. No. 37

15. **What is the distance to the nearest downslope surface water? Measure the distance along a course that runoff can be expected to follow.**

The Passaic River is adjacent to the site property.

Ref. No. 43

16. **Identify uses of surface waters within 3 miles downstream of the site (i.e., drinking, irrigation, recreation, commercial, industrial, not used).**

The designated uses of surface waters within 3 miles downstream of the site include secondary contact recreation and maintenance or migration of fish or wildlife. There reportedly are also industrial uses of the river.

Ref. Nos. 45, 47, 48

17. **Describe any wetlands, greater than 5 acres in area, within 2 miles downstream of the site. Include whether it is a freshwater or coastal wetland.**

There are no wetlands, greater than 5 acres in area, within 2 miles of the site.

Ref. No. 43

18. **Describe any critical habitats of federally listed endangered species within 2 miles of the site along the migration path.**

There are no critical habitats of federally listed endangered species within 2 miles of the site.

Ref. No. 44

19. **What is the distance to the nearest sensitive environment along or contiguous to the migration path (if any exist within 2 miles)?**

There are no sensitive environments within 2 miles along a migration pathway.

Ref. Nos. 43, 44

20. Identify the population served or acres of food crops irrigated by surface water intakes within 3 miles downstream of the site and the distance to the intake(s).

There are no known surface water intakes within 3 miles downstream of the site for irrigation or public supply.

Ref. Nos. 45, 46

21. What is the state water quality classification of the water body of concern?

The state water quality classification of the Passaic River is SE3.

Ref. Nos. 47, 48

22. Describe any apparent biota contamination that is attributable to the site.

There are no known documented incidents of biota contamination that can be attributed to the site.

Ref. Nos. 3, 10, 50

AIR ROUTE

23. Describe the likelihood of a release of contaminant(s) to the air as follows: observed, alleged, potential, none. Identify the contaminant(s) detected or suspected, and provide a rationale for attributing the contaminant(s) to the facility.

There have been no documented incidents of a release of contaminants to the air at this site. However, it was noted in a 1987 RCRA inspection report that there were drums of paraformaldehyde in Building 7 that were open to the atmosphere. On July 20, 1987, approximately 25 pounds of perchloroethylene were released from a tank trailer's leaking valve. Also, a condensate return line from a rail car was not hooked up properly, allowing steam to escape into the atmosphere.

Ref. Nos. 3, 10, 21, 22, 23, 24

24. What is the population within a 4-mile radius of the site?

The population within a 4-mile radius of the site is approximately 561,700.

Ref. No. 49

FIRE AND EXPLOSION

25. Describe the potential for a fire or explosion to occur with respect to the hazardous substance(s) known or suspected to be present on site. Identify the hazardous substance(s) and the method of storage or containment associated with each.

There is a potential for a fire or explosion to occur as a result of hazardous substances stored on site, as flammable substances are reportedly handled at the facility. A potentially explosive situation was noted on the third floor of Building 7 during a 1987 RCRA inspection.

Ref. Nos. 10, 11, 46

26. What is the population within a 2-mile radius of the hazardous substance(s) at the facility?

The population within a 2-mile radius of the site is approximately 171,600.

Ref. No. 49

DIRECT CONTACT/ON-SITE EXPOSURE

- 27. Describe the potential for direct contact with hazardous substance(s) stored in any of the waste units on site or deposited in on-site soils. Identify the hazardous substance(s) and the accessibility of the waste unit.**

The potential for direct contact by the public with hazardous substances stored in the waste units on site cannot be fully assessed. The water and unspecified acid blends were contained in an underground tank, which was reported to be in sound condition. An area outside of Building 7 was contaminated with unknown chemicals that dripped from pipes and hoses. The site is encompassed by a chain link fence. On July 20, 1987, approximately 25 pounds of perchloroethylene were released from a tank trailer's leaking valve; however, it is unknown whether this occurred inside or outside of the fence.

Ref. Nos. 3, 10, 21, 22, 23, 24, 50

- 28. How many residents live on a property whose boundaries encompass any part of an area contaminated by the site?**

There are no residents who live on a property whose boundaries encompass any part of an area known to have been contaminated by the site.

Ref. Nos. 10, 21, 22, 23, 24, 43, 50

- 29. What is the population within a 1-mile radius of the site?**

The population within a 1-mile radius of the site is approximately 62,800.

Ref. No. 49

PART IV: SITE SUMMARY AND RECOMMENDATIONS

The Jobar Packaging, Inc. Site is located in an industrial/residential area in Newark, Essex County, New Jersey. The site is a multi-tenant industrial complex, and was previously owned and operated by Pittsburgh Plate Glass. The facility packaged industrial chemicals; operations began on November 1, 1979 and ceased on October 31, 1982, when Jobar Packaging declared insolvency. On August 10, 1983, Frey Industries, Inc. informed the New Jersey Department of Environmental Protection (NJDEP) that it had purchased the assets of Jobar Packaging, Inc. Frey Industries signed a month-to-month lease with Industrial Development Association for occupancy of Building 7, and also occupies Buildings 2, 3, 9, and 12. The nature and operation of the facility under Frey Industries are the same as those under Jobar Packaging, Inc. Industrial chemicals are brought from around the world to the facility on railcars, tank trucks, and isotanks. The facility warehouses, packages, and distributes these products, but does not own them. The products that are warehoused include polyester resins, flammable liquids, acids, bases, corrosives, and poisons.

Jobar Packaging, Inc. filed a notification of hazardous waste activity on August 14, 1980. The company was listed as a Treatment, Storage, or Disposal (TSD) facility. Frey Industries, Inc. was also classified as a TSD facility; however, the company maintained that it should be classified as a generator only, and requested delisting as a TSD facility in October 1984. Frey Industries, Inc. could not change its status until a formal closure plan for an underground tank and for tanks inside Building 7 was submitted. The company submitted a closure plan on November 26, 1984; however, it was found deficient because the plan did not include a sampling plan for the underground tank and surrounding soil, and also did not address the tanks in Building 7. The NJDEP presumed that the wastes, sludges, gums, and other residues remaining in these tanks were hazardous. It is unknown whether an amended closure plan was submitted. The company was also involved in the packaging of hazardous waste for other companies; this activity also classified Frey Industries as a TSD facility. The NJDEP advised Frey Industries to cease this activity so that it could be delisted from a TSD facility to a generator only.

The site includes Buildings 2, 3, 7, 9, and 12. Buildings 2 and 3 are used for storage of liquid raw materials; Building 7 is used for repackaging of dyes, pigments, and storage; Building 9 is used for storage of general products, and isotanks filled with poison are stored outside of this building. Building 12 is used for general storage. The tanks present on site include an underground tank located beneath Building 7, five 1,500-gallon tanks and five 3,000-gallon tanks located on the second floor of Building 7, and seventy-two 2,000-gallon tanks located on the third floor of Building 7. Frey Industries reported in 1984 that the owners of the facility intended to remove and sell all of the

PART IV: SITE SUMMARY AND RECOMMENDATIONS

(Cont'd)

tanks "in the near future." However, these tanks were still on site at the time of an April 1987 NJDEP RCRA inspection. Improperly stored drums and exposed raw materials were also on the third floor of Building 7 at the time of the April 1987 NJDEP RCRA inspection.

The waste units present on site are a 100,000-gallon underground storage tank located beneath Building 7, and contaminated soil located outside of Building 7. Jobar Packaging Inc. used the underground tank to collect filling line washings. A 1982 RCRA inspection report indicated that the tank contained 2,000 gallons of water and unspecified acids. Frey Industries, Inc. reported that it discontinued this operation on September 7, 1984, and that any future line washings would be collected in a 55-gallon drum. The NJDEP reported that on October 1, 1984, there was approximately 6 inches of liquid and sludge in the underground tank. The April 1987 RCRA inspection report indicated that there was a dark stained area located at the entrance to Building 7. An unpaved area apparently was contaminated with chemicals that dripped from pipes and hoses used to fill drums. Soil samples were to have been collected from this area and analyzed for potential hazardous waste contamination. It is not known whether any samples were actually collected from this area or what the analytical results were. On March 19, 1987, the NJDEP issued an Administrative Order and Notice of Civil Administrative Penalty Assessment to Frey Industries, Inc. for the closure of the underground tank and the tanks in Building 7. It was reported that these tanks were previously used by Pittsburgh Plate Glass. The April 1987 inspection report indicated that cleanup and removal of the contaminated soil outside of Building 7 should be incorporated into the closure plan that the NJDEP requested of Frey Industries, Inc.

The April 1987 RCRA inspection report also indicated that Frey Industries was not classifying spilled materials (floor sweepings) as a hazardous waste; however, as a result of the inspection, the company agreed to classify these materials as a hazardous waste and to manage it accordingly. The specific method of management is not known.

On July 20, 1987, approximately 25 pounds of perchloroethylene were released from a tank trailer's leaking valve. A New Jersey Hazmat team responded to the incident, and placed a 55-gallon drum under the valve. The leaking valve was to be addressed the next morning. The tank trailer was owned by Baron Blakeslee, and the property on which the trailer was located was leased to them by Frey Industries, Inc. Also observed on site at the time were truck trailers filled with drums that had previously contained acetyl chloride, and a trailer containing approximately 40 boxes of jars of unknown liquid content, some of which reportedly appeared to be a petroleum product.

PART IV: SITE SUMMARY AND RECOMMENDATIONS

(Cont'd)

The site is located in a residential setting and is surrounded by a chain link fence. Public access to the site is restricted; however, it is uncertain whether the perchloroethylene release occurred inside or outside of the fence. There is potential for contamination of the underlying soils and groundwater; however, groundwater is used only for industrial and commercial purposes, and not as a source of drinking water. There is a potential surface migration pathway due to the contaminated soil located approximately 100 feet from the Passaic River. There are no known surface water intakes within 3 miles downstream of the facility; however, the Passaic River is designated for recreational use and for the maintenance or migration of fish populations downstream of the site.

A **MEDIUM PRIORITY** for further action is recommended based on the potential for direct contact by the public with site contamination, and the projection of a release of contaminants to the Passaic River. Additional background information should be obtained and an on-site reconnaissance should be conducted to determine the location and cleanup status of the perchloroethylene release. Similarly, the areal extent and cleanup status of the contaminated soil outside of Building 7 should be determined. Potential drainage pathways from these areas to surface water should also be assessed. If the affected areas have not been remediated, or if additional information concerning these areas is unavailable, soil sampling is recommended to characterize the nature of contamination outside of Building 7 and to document the presence and concentrations of perchloroethylene. Surface water or sediment samples should also be collected from the Passaic River, if possible, in an effort to document a release to surface water.

The closures needed at this facility, all in Building 7, consist of the following:

1. 44,880 gallon bottomless underground storage tank - (acts as a drain for the 1st floor)
2. Five 3000 gallon tanks (2nd floor)
Five 1500 gallon tanks (2nd floor)
Seventy-two 2000 gallon tanks (3rd floor)

Hazardous waste listed on the part A application for storage in tanks are the following:

U034	1-Butanol (I)
U044	Cloroform
U054	Cresylic Acid
U134	Hydrogen Flouride (C,T)
U188	Benzene, hydroxy-
D001	Characteristics of Ignitability
D002	Characteristics of Corrosivity

The major concern for this site is who is going to pay for the cleanup. This site was originally owned and operated by Pittsburgh Plating and Glass until 1974. A private investor bought the facility and then defaulted on the taxes. The city of Newark owned the property until 1979. At this time Mr. Pugliese bought the facility. Jobar Packaging leased space, Building 7 inclusive, from Mr. Pugliese. On August 8, 1980 Jobar filed a Part A application with the EPA stating the 83 tanks were hazardous waste storage tanks. The assets of Jobar were then liquidated on October 31, 1982. Frey Industries established an operation similar to that previously run by Jobar, in 1982. Frey has rented and occupied several buildings on-site, including Building #7, since 1982.

Frey Industries contends that they are not responsible for the closure since it has neither owned nor operated these tanks while conducting business at the facility. Mr. Pugliese, the present property owner contends that Frey Industries had taken over the Jobar Packaging business and should therefore be responsible for the closure. Enclosed is a letter from Frey Industries stating that they should not be responsible for the closure of the site.

Ken Ratzman and Bill Sharples of the BHWE performed a site inspection February 22, 1991 and concluded that the 72 tanks on the third floor and the 10 tanks on the second floor have not been used since Pittsburgh Plating & Glass left the facility, but it is possible that the underground storage tank may have been used since repackaging was done on the first floor. It was evident to the DEP staff members that the resins and shellac waste has been in the 72 tanks on the third floor since Pittsburgh Plating and Glass vacated the premises. As stated earlier, the underground tank acts as a drain for any spill on the first floor.

DOCUMENT: TRANSFE5
FOLDER: DBMMCB

CP

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Comprehensive Site List
CASE ASSIGNMENT TRACKING SUMMARY
Name E I DUPONT DE NEMOURS & COMPANY
ID NJD980530695
Addr MANTUA AVE
Munic PAULSBORO BOROUGH
County GLOUCESTER COMU 0814
File Number KS192
Remedial Status TBA Remedial Lead Status Date 06/27/1995
File Number Confirmed Contamination (Y/N)
Remedial Status Remedial Lead Status Date
File Number Confirmed Contamination (Y/N)
Remedial Status Remedial Lead Status Date
File Number Confirmed Contamination (Y/N)
Remedial Status Remedial Lead Status Date
Press Enter to continue.

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Comprehensive Site List
CASE ASSIGNMENT TRACKING SUMMARY
Name JOBAR PACKAGING INCORPORATED
ID NJD000729780
Addr 29 RIVERSIDE AVE
Munic NEWARK CITY
County ESSEX COMU 0714
File Number KS024
Remedial Status TBA Remedial Lead Status Date 06/27/1995
File Number Confirmed Contamination (Y/N)
Remedial Status Remedial Lead Status Date
File Number Confirmed Contamination (Y/N)
Remedial Status Remedial Lead Status Date
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No RPS score no CAS file

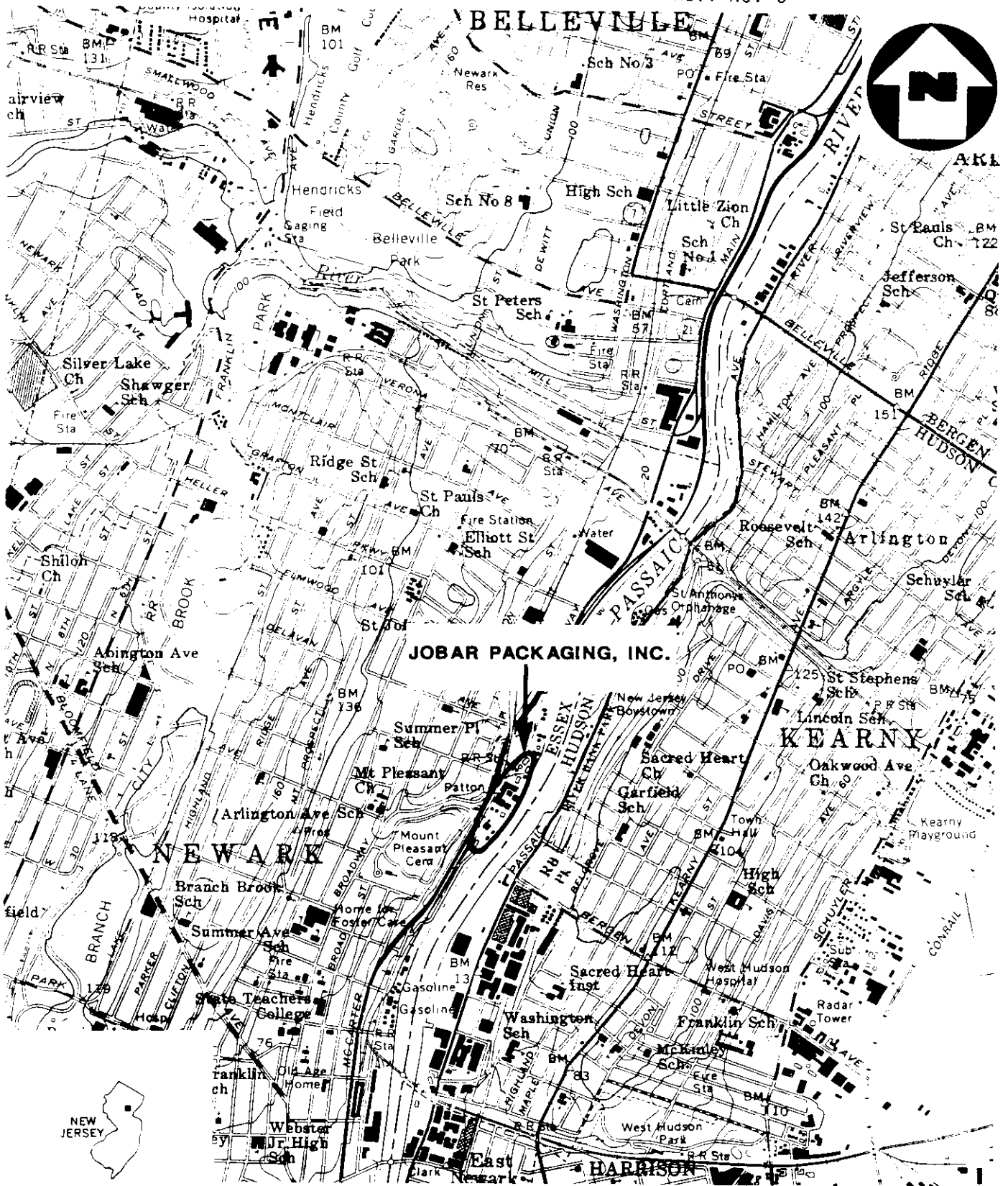
SA-115

ATTACHMENT 1

JOBAR PACKAGING, INC.
NEWARK , NEW JERSEY

CONTENTS

Figure 1: Site Location Map
Figure 2: Site Map
Exhibit A: Photograph Log



(QUAD) ORANGE, N.J.

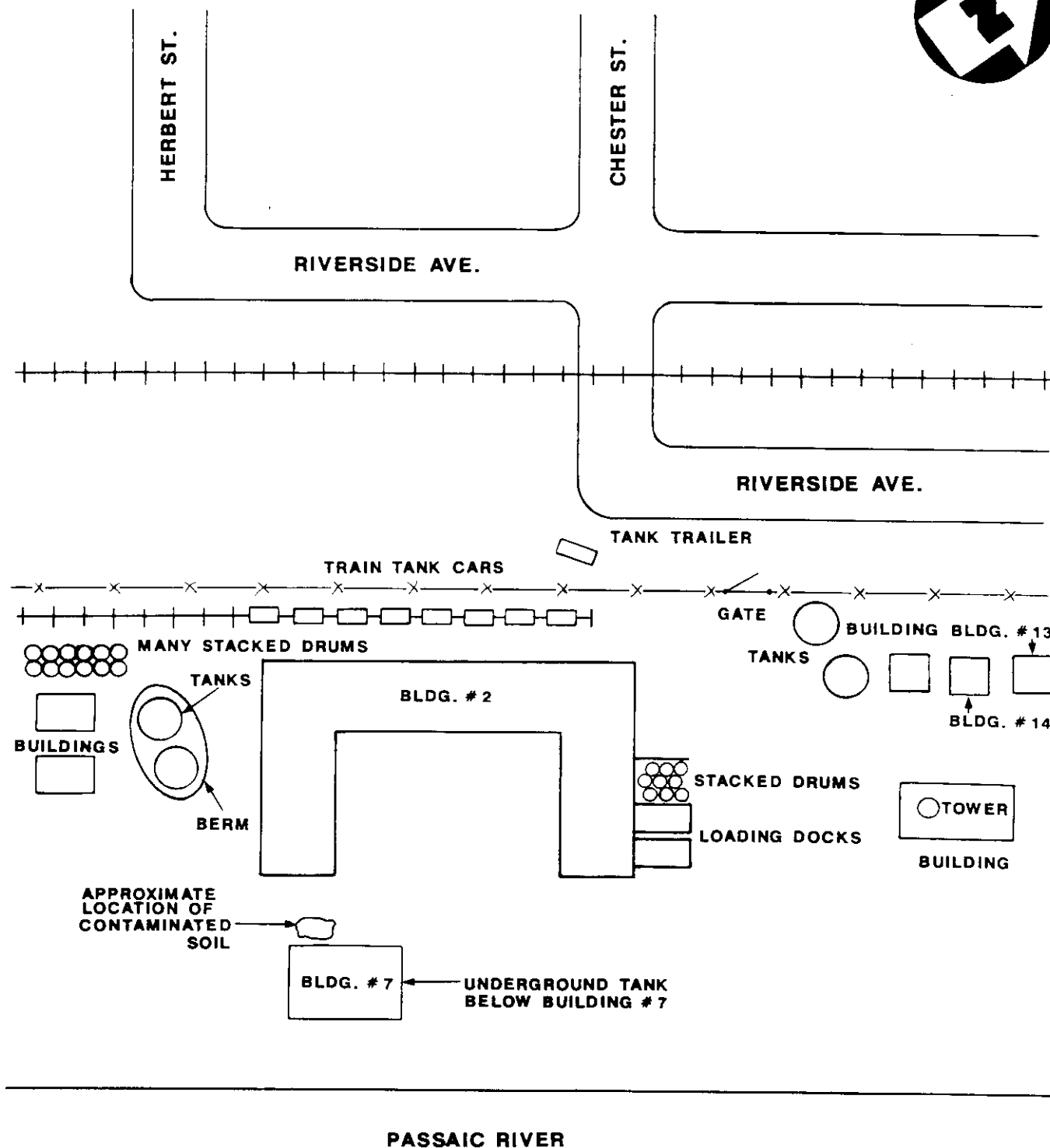
FIGURE 1

SITE LOCATION MAP

JOBAR PACKAGING, INC., NEWARK, N.J.

SCALE: 1" = 2000'





SITE MAP

JOBAR PACKAGING INC., NEWARK, NJ

NOT TO SCALE

FIGURE 2



EXHIBIT A

PHOTOGRAPH LOG

JOBAR PACKAGING, INC.
NEWARK, NEW JERSEY

OFF-SITE RECONNAISSANCE: MAY 4, 1989

JOBAR PACKAGING, INC.
NEWARK, NEW JERSEY
MAY 4, 1989

PHOTOGRAPH INDEX

ALL PHOTOGRAPHS TAKEN BY GERRY GILLILAND

<u>Photo Number</u>	<u>Description</u>	<u>Time</u>
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2P-9	Looking southeast at directory sign near entrance gate.	1303
2P-10	Looking along northwest side of facility from Chester Street	1305
2P-11,12	Panoramic view looking northeast to southwest from Riverside Avenue.	1309
2P-13,14	Panoramic view looking northeast to southwest from Riverside Avenue.	1309
2P-15	Looking southeast at Glosstex building from Riverside Avenue	1314
2P-16	Looking southeast at building No. 14, from Riverside Avenue, with outside discharge pipe.	1318
2P-17	Looking southeast from Herbert Avenue at large bermed tank and railroad tank cars.	1328
2P-18	Looking south from Herbert Avenue at drums stacked near building.	1330

JOBAR PACKAGING, INC., NEWARK, NEW JERSEY

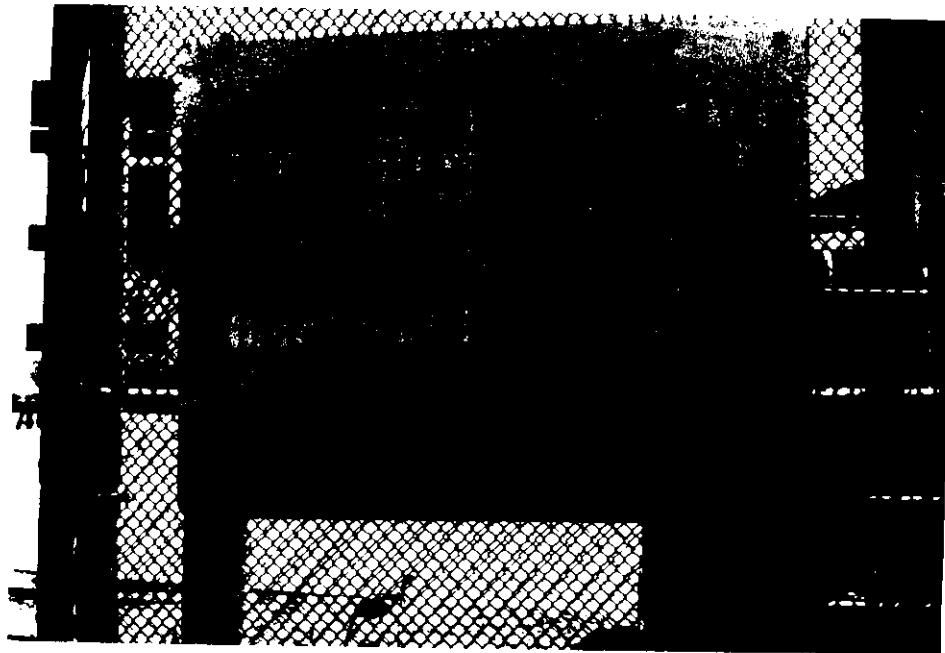


2P-8

May 4, 1989

1301

Looking south through entrance gate at loading docks.



2P-9

May 4, 1989

1303

Looking southeast at directory sign near entrance gate.

JOBAR PACKAGING, INC.
NEWARK, NEW JERSEY



2P-10

May 4, 1989

1305

Looking along northwest side of facility from Chester Street.

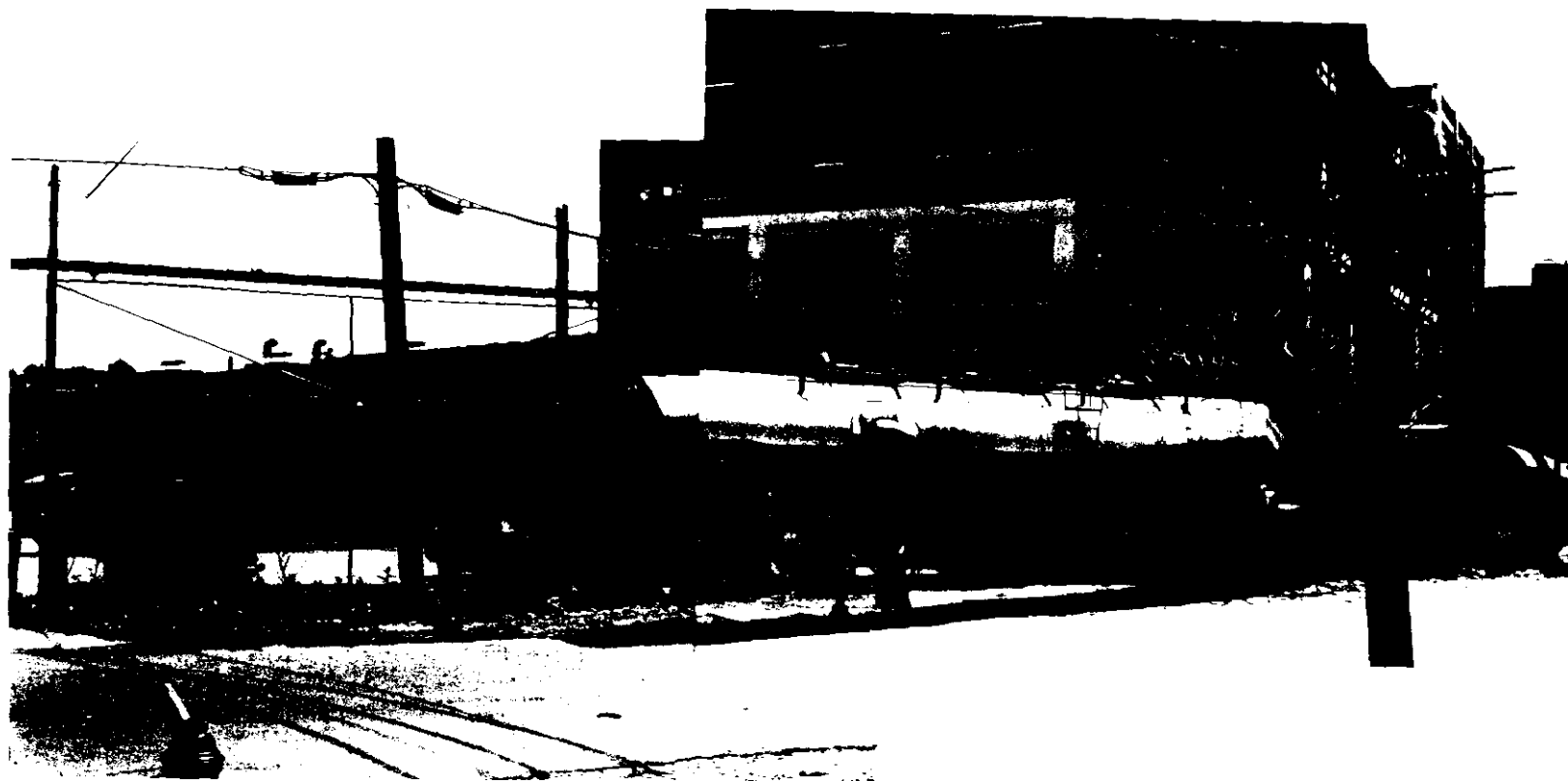


2P-11, 12

May 4, 1989

1309

Panoramic view looking northeast to southwest from Riverside Ave.



2P-13, 14

May 4, 1989

1309

Panoramic view looking northeast to southwest from Riverside Ave.

JOBAR PACKAGING, INC.
NEWARK, NEW JERSEY



2P-15

May 4, 1989

1314

Looking southeast at Glosstex building from Riverside Ave.



2P-16

May 4, 1989

1318

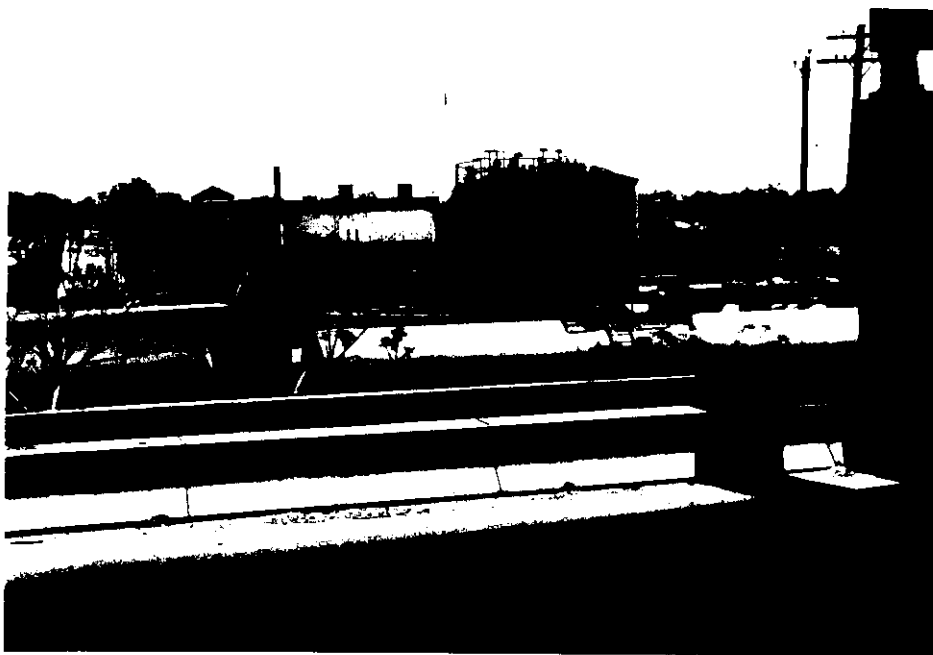
Looking southeast at building No. 14, from Riverside Ave.,
with outside discharge pipe.



NUS
CORPORATION

02-8905-03-PA
Rev. No. 0

JOBAR PACKAGING, INC.
NEWARK, NEW JERSEY

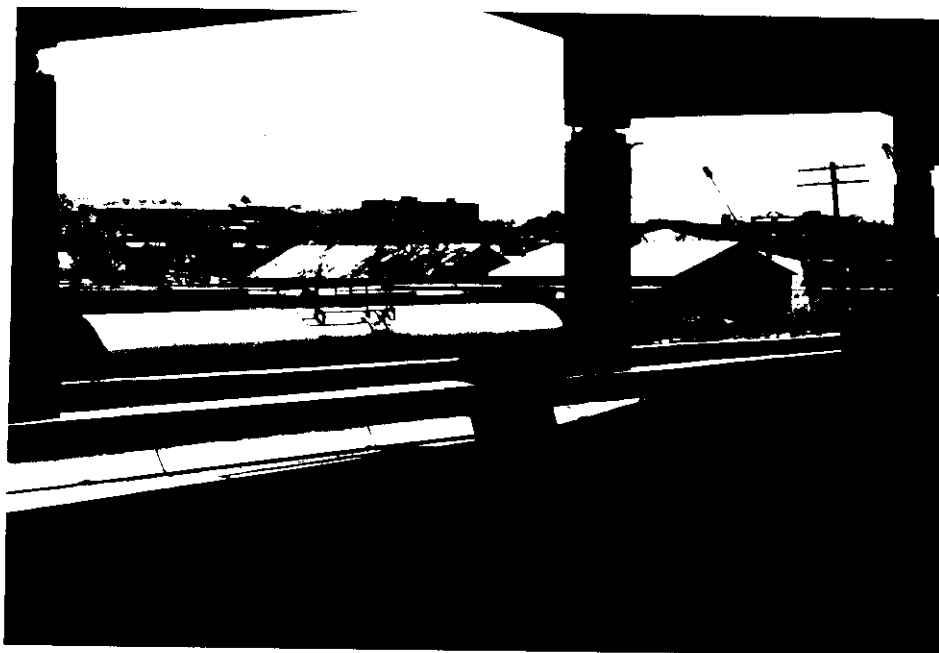


2P-17

May 4, 1989

1328

Looking southeast from Herbert Avenue at large bermed tanks and railroad tank cars.



2P-18

May 4, 1989

1330

Looking south from Herbert Avenue at drums stacked near building.

ATTACHMENT 2

REFERENCES

1. United States Environmental Protection Agency Forms for Jobar Packaging, Inc.; 8700-12 (6-80), 3510-1 (6-80), and 3510-3 (6-80).
2. EPA Acknowledgement of Notification of Hazardous Waste Activity for Jobar Packaging, Inc., November 7, 1980.
3. RCRA Generator Inspection Form, Jobar Packaging, Inc., prepared by Bob Dante, New Jersey Department of Environmental Protection, June 2, 1982.
4. Letter from Barry M. Kessler, Jobar Packaging, and Warehousing, Inc., to Mr. Conrad Simon, Director, Air and Waste Management Division, United States Environmental Protection Agency, February 15, 1983.
5. Letter from Carol S. Lucey, Supervising Geologist, Division of Water Resources, State of New Jersey, Department of Environmental Protection, to Mr. Kessler, Jobar Packaging, Inc., November 12, 1980.
6. Letter from Thomas Micai, Assistant Supervisor, New Source Review Section, Bureau Air Pollution Control, Division of Environmental Quality, State of New Jersey, Department of Environmental Protection, to Mr. Barry Kessler, Jobar Packaging and Warehousing, June 3, 1982.
7. Letter from Barry M. Kessler, Jobar Packaging, Inc., to Mr. Bara, Division of Environmental Quality, State of New Jersey, Department of Environmental Protection, June 24, 1982.
8. United States Environmental Protection Agency General Information Form for Frey Industries, Inc., EPA Form 3510-1 (6-80).
9. New Jersey State Department of Environmental Protection Memo from Chris Felicetti, to BHWE file through Y.E. Yacoub (both of NJDEP), Subject: Status of Frey Industries, Inc., March 28, 1988.
10. RCRA Inspection Report prepared by Wayne Green, New Jersey Department of Environmental Protection, April 2, 1987.
11. Hazardous Waste Manifest Forms and Uniform Hazardous Waste Manifest Forms, State of New Jersey, Department of Environmental Protection, Division of Waste Management, January 2, 1987.
12. Administrative Order and Notice of Civil Administrative Penalty Assessment Form, in the matter of Frey Industries, Inc., State of New Jersey, Department of Environmental Protection, Division of Hazardous Waste Management, March 19, 1987.
13. Letter from Gary S. Redish, Law Offices, Cole, Geaney, Yamner, and Byrne, to Arnold Schiff, Bureau of Compliance and Technical Services, Division of Hazardous Waste Management, State of New Jersey, Department of Environmental Protection, April 9, 1987.
14. Letter from Richard J. Katz, Vice President, Enviro-Sciences, Inc., to Mr. Arnold Schiff, Bureau of Field Operations, State of New Jersey, Department of Environmental Protection, April 13, 1987.

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15. Letter from Gary S. Redish, Law Offices, Cole, Geaney, Yamner and Byrne, to Mr. Arnold Schiff, Division of Hazardous Waste Management, State of New Jersey, Department of Environmental Protection, April 14, 1987.
16. Letter from Mark Andersen, Lab Manager, Townley Research and Consulting, Inc., to Mr. Don Swanson, Advanced Environmental Technology Corporation, May 20, 1987.
17. Letter from Robert P. Dante, Senior Project Manager, Enviro-Sciences, Inc., to Mr. Arnold Schiff, NJDEP, Bureau Field Operations, Metro Region, May 27, 1987.
18. Letter from Terri Marlow, Sales Service Representative, Advanced Environmental Technology Corporation, to Mr. Bob Dante, Enviro-Sciences, Inc., June 16, 1987.
19. Letter from Robert Dante, Senior Project Manager, Enviro-Sciences, Inc., to Mr. Arnold Schiff, NJDEP, Bureau of Field Operations, Metro Region, June 23, 1987.
20. Letter from Robert Dante, Senior Project Manager, Enviro-Sciences, Inc., to Kurt Whitford, Bureau of Hazardous Waste Planning and Classification, State of New Jersey Department of Environmental Protection, June 23, 1987.
21. Communications Center Notification Report and Duty Officer Notification Report, New Jersey Department of Environmental Protection, Division of Environmental Quality, Bureau of Communications and Support Services, July 24, 1987 and July 20, 1987.
22. Letter from Baron Blakeslee, Inc., to New Jersey Department of Environmental Protection, Hazardous Waste Bureau, September 16, 1987.
23. Investigation Form, prepared by Dwyer/Pals, New Jersey Department of Environmental Protection, Division of Environmental Quality, Bureau of Emergency Response, concerning Frey Industries, Inc., July 20, 1987.
24. Letter from Tilghman B. Frey, Frey Industries, Inc., to Chief Stanley Kossup, Newark Fire Department, July 22, 1987.
25. Hazardous Waste Compliance Monitoring and Enforcement Log, Prepared by Wayne Green, New Jersey Department of Environmental Protection, concerning Frey Industries, Inc., April 2, 1987.
26. Letter from Robert P. Dante, Senior Project Manager, Enviro-Sciences, Inc., to Mr. Arnold Schiff, NJDEP Bureau of Field Operations, Metro Region, September 17, 1987.
27. Letter from Frank Coolick, Chief, Bureau of Hazardous Waste Engineering, State of New Jersey, Department of Environmental Protection, to Tilghman B. Frey, President, Frey Industries, Inc., January 18, 1985.
28. New Jersey Department of Environmental Protection, Hazardous Waste Facility Annual Report - Part 1, Calendar Year Covered 1983 - 1984, concerning Frey Industries, Inc.
29. Letter from Tilghman B. Frey, Frey Industries, Inc., to Chief Shotwell, Division of Waste Management, State of New Jersey, Department of Environmental Protection, September 7, 1984.

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30. Letter from Tilghman B. Frey, Frey Industries, Inc. to Mr. Frank Coolick, Chief, Bureau of Hazardous Waste Engineering, State of New Jersey, Department of Environmental Protection, November 26, 1984.
31. Letter from Joseph A. Rogalski, Assistant Director, Division of Waste Management, State of New Jersey, Department of Environmental Protection, to Tilghman B. Frey, Frey Industries Inc., December 12, 1983.
32. Letter from Frank Coolick, Chief, Bureau of Hazardous Waste Engineering, State of New Jersey, Department of Environmental Protection, to Tilghman B. Frey, Frey Industries, Inc., August 17, 1983.
33. Nichols, William D. Ground-Water Resources of Essex County, New Jersey, Special Report No. 28, U.S. Geological Survey, 1968.
34. Herpers, Henry and Henry C. Barksdale, Preliminary Report on the Geology and Ground-Water Supply of the Newark, New Jersey Area, Special Report 10, United States Department of the Interior Geological Survey, 1951.
35. Telecon Note: Conversation between Drew Baris, EPA Region 2 - Office of Groundwater Management, and Edmund Knyfd Jr., NUS Corporation, Region 2 FIT, Edison, N.J., May 15, 1989.
36. The Hydrogeology of the Buried Valley Aquifer System, Passaic River Coalition, 1983.
37. Uncontrolled hazardous waste site ranking system, A user's manual, 40 CFR, Part 300, Appendix A, 1986.
38. Water Supply Overlay Sheet 26, State of New Jersey, Department of Environmental Protection.
39. Telecon Note: Conversation between Mr. Anthony DeBarros, Newark Water Supply (Little Falls), and Sue Lenczyk, NUS Corporation, Region 2 FIT, Edison, N.J., May 4, 1989.
40. Telecon Note: Conversation between Mr. James Horbath, East Orange Water Department Pumping Station, and Sue Lenczyk, NUS Corporation, Region 2 FIT, Edison, N.J., June 6, 1989.
41. Telecon Note: Conversation between Mr. Al Ronaldson, Construction Officer, U.S. Navy, and Edmund Knyfd Jr., NUS Corporation, Region 2 FIT, Edison, N.J., May 16, 1989.
42. Project Note from Edmund Knyfd Jr., to Cellofilm Corporation File, Subject: Potential for Public Supply Well Contamination, May 16, 1989.
43. Three-Mile Vicinity Map, based on U.S. Department of the Interior, U.S. Geological Survey Topographic Maps, 7.5 Minute Series: "Orange Quadrangle, New Jersey", 1955, photorevised 1981; "Jersey City Quadrangle, New Jersey", 1967, photorevised 1981; "Elizabeth Quadrangle, New Jersey - New York", 1967, photorevised 1981; "Weehawken, New Jersey - New York", 1967; photorevised 1981.
44. Atlantic Coast Ecological Inventory, Newark, N.J. - N.Y. - P.A., 1980.

REFERENCES(cont'd)

45. Telecon Note: Conversation between Mr. Alvi, Newark Engineering Department, and Sue Lenczyk, NUS Corporation, Region 2 FIT, Edison, N.J., May 4, 1989.
46. Encyclopedia of Occupational Health and Safety, International Labour Organization, 1983, Volume 1, A-K, pages 914 and 915.
47. Surface Water Classifications, Surface Water Quality Standards, N.J.A.C. 7:9-4, NJDEP, Division of Water Resources, May 1985.
48. Surface Water Quality Standards, N.J.A.C. 7:9-4.1; et seq., NJDEP, Division of Water Resources, May 1985.
49. General Sciences Corporation, Graphical Exposure Modeling System (GEMS). Landover, Maryland, 1986.
50. Preliminary Assessment Off-Site Reconnaissance Information Reporting Form, Jobar Packaging, Inc., TDD No. 02-8905-03, NUS Corporation Region 2 FIT, Edison, New Jersey, May 4, 1989.
51. National Flood Insurance Program, Flood Insurance Rate Map, City of Newark, New Jersey, Essex County, Panel 1 of 12, U.S. Department of Housing and Urban Development, March 28, 1980.

REFERENCE NO. 1

U.S. ENVIRONMENTAL PROTECTION AGENCY
NOTIFICATION OF HAZARDOUS WASTE ACTIVITY

INSTRUCTIONS: If you received a preprinted label, affix it in the space at left. If any of the information on the label is incorrect, draw a line through it and supply the correct information in the appropriate section below. If the label is complete and correct, leave Items I, II, and III below blank. If you did not receive a preprinted label, complete all items. "Installation" means a single site where hazardous waste is generated, treated, stored and/or disposed of, or a transporter's principal place of business. Please refer to the INSTRUCTIONS FOR FILING NOTIFICATION before completing this form. The information requested herein is required by law (Section 3010 of the Resource Conservation and Recovery Act).

INSTALLATION'S EPA I.D. NO.

I. NAME OF INSTALLATION

II. INSTALLATION MAILING ADDRESS

III. LOCATION OF INSTALLATION

PLEASE PLACE LABEL IN THIS SPACE

FOR OFFICIAL USE ONLY

COMMENTS

INSTALLATION'S EPA I.D. NUMBER

APPROVED

DATE RECEIVED
(yr., mo., & day)

F A I D 000729780

800818

I. NAME OF INSTALLATION

F A I D 000729780

II. INSTALLATION MAILING ADDRESS

STREET OR P.O. BOX

321 STREET ROAD

CITY OR TOWN

NEWARK

ST.

ZIP CODE

NJ 07104

III. LOCATION OF INSTALLATION

STREET OR ROUTE NUMBER

529 ALEXANDER ALEXANDER BUILDING 7

CITY OR TOWN

NEWARK

ST.

ZIP CODE

NJ 07104

IV. INSTALLATION CONTACT

NAME AND TITLE (last, first, & job title)

2 KESSLER HARRY M PRESIDENT

PHONE NO. (area code & no.)

215-595-7141

V. OWNERSHIP

A. NAME OF INSTALLATION'S LEGAL OWNER

8 HARRY M KESSLER

B. TYPE OF OWNERSHIP
(enter the appropriate letter into box)F = FEDERAL
M = NON-FEDERAL

M

VI. TYPE OF HAZARDOUS WASTE ACTIVITY (enter "X" in the appropriate box(es))

☒ A. GENERATION☐ B. TRANSPORTATION (complete item VII)☒ C. TREAT/STORE/DISPOSE☐ D. UNDERGROUND INJECTION

VII. MODE OF TRANSPORTATION (transporters only - enter "X" in the appropriate box(es))

☐ A. AIR☐ B. RAIL☐ C. HIGHWAY☐ D. WATER☐ E. OTHER (specify):

VIII. FIRST OR SUBSEQUENT NOTIFICATION

Mark "X" in the appropriate box to indicate whether this is your installation's first notification of hazardous waste activity or a subsequent notification. If this is not your first notification, enter your Installation's EPA I.D. Number in the space provided below.

☒ A. FIRST NOTIFICATION☐ B. SUBSEQUENT NOTIFICATION (complete item C)

C. INSTALLATION'S EPA I.D. NO.

IX. DESCRIPTION OF HAZARDOUS WASTES

Please go to the reverse of this form and provide the requested information.

I.D. - FOR OFFICIAL USE ONLY													
W	U	S	D	0	0	7	2	9	7	8	0	2	1
1	2	3	4	5	6	7	8	9	10	11	12	13	14

IX. DESCRIPTION OF HAZARDOUS WASTES (continued from front)

A. HAZARDOUS WASTES FROM NON-SPECIFIC SOURCES. Enter the four-digit number from 40 CFR Part 261.31 for each listed hazardous waste from non-specific sources your installation handles. Use additional sheets if necessary.

1	2	3	4	5	6
23 - 26	23 - 26	23 - 26	23 - 26	23 - 26	23 - 26
7	8	9	10	11	12
23 - 26	23 - 26	23 - 26	23 - 26	23 - 26	23 - 26

B. HAZARDOUS WASTES FROM SPECIFIC SOURCES. Enter the four-digit number from 40 CFR Part 261.32 for each listed hazardous waste from specific industrial sources your installation handles. Use additional sheets if necessary.

13	14	15	16	17	18
23 - 26	23 - 26	23 - 26	23 - 26	23 - 26	23 - 26
19	20	21	22	23	24
23 - 26	23 - 26	23 - 26	23 - 26	23 - 26	23 - 26
25	26	27	28	29	30
23 - 26	23 - 26	23 - 26	23 - 26	23 - 26	23 - 26

C. COMMERCIAL CHEMICAL PRODUCT HAZARDOUS WASTES. Enter the four-digit number from 40 CFR Part 261.33 for each chemical substance your installation handles which may be a hazardous waste. Use additional sheets if necessary.

31	32	33	34	35	36
4002	4001	4002	4037	4054	4070
23 - 26	23 - 26	23 - 26	23 - 26	23 - 26	23 - 26
37	38	39	40	41	42
4072	4188				
23 - 26	23 - 26	23 - 26	23 - 26	23 - 26	23 - 26
43	44	45	46	47	48
23 - 26	23 - 26	23 - 26	23 - 26	23 - 26	23 - 26

D. LISTED INFECTIOUS WASTES. Enter the four-digit number from 40 CFR Part 261.34 for each listed hazardous waste from hospitals, veterinary hospitals, medical and research laboratories your installation handles. Use additional sheets if necessary.

49	50	51	52	53	54
23 - 26	23 - 26	23 - 26	23 - 26	23 - 26	23 - 26

E. CHARACTERISTICS OF NON-LISTED HAZARDOUS WASTES. Mark "X" in the boxes corresponding to the characteristics of non-listed hazardous wastes your installation handles. (See 40 CFR Parts 261.21 - 261.24.)

☒ 1. IGNITABLE
(D001)

☒ 2. CORROSIVE
(D002)

☐ 3. REACTIVE
(D003)

☒ 4. TOXIC
(D004)

X. CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

SIGNATURE	NAME & OFFICIAL TITLE (type or print)	DATE SIGNED
Barry M. Kessler	Barry M. Kessler - President	8-14-80

10/2

FORM 1 GENERAL	U.S. ENVIRONMENTAL PROTECTION AGENCY GENERAL INFORMATION <i>Consolidated Permits Program</i> <i>(Read the "General Instructions" before starting.)</i>	I. EPA I.D. NUMBER <div style="border: 1px solid black; padding: 2px;"> F I N J D O 0 0 7 2 9 7 8 0 3 D </div>
LABEL ITEMS <div style="border: 1px solid black; padding: 5px;"> I. EPA I.D. NUMBER III. FACILITY NAME V. FACILITY MAILING ADDRESS VI. FACILITY LOCATION </div>		GENERAL INSTRUCTIONS <p>If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill-in area below. Also, if any of the preprinted data is absent (the area to the left of the label space lists the information that should appear), please provide it in the proper fill-in area(s) below. If the label is complete and correct, you need not complete items I, III, V, and VI (except VI-B which must be completed regardless). Complete all items if no label has been provided. Refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.</p>
PLEASE PLACE LABEL IN THIS SPACE		

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold-faced terms.

SPECIFIC QUESTIONS	MARK 'X'			SPECIFIC QUESTIONS	MARK 'X'		
	YES	NO	FORM ATTACHED		YES	NO	FORM ATTACHED
A. Is this facility a publicly owned treatment works which results in a discharge to waters of the U.S.? (FORM 2A)		X		B. Does or will this facility (either existing or proposed) include a concentrated animal feeding operation or aquatic animal production facility which results in a discharge to waters of the U.S.? (FORM 2B)		X	
C. Is this a facility which currently results in discharges to waters of the U.S. other than those described in A or B above? (FORM 2C)		X		D. Is this a proposed facility (other than those described in A or B above) which will result in a discharge to waters of the U.S.? (FORM 2D)		X	
E. Does or will this facility treat, store, or dispose of hazardous wastes? (FORM 3)	X		X	F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		X	
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		X		H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)		X	
I. Is this facility a proposed stationary source which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X		J. Is this facility a proposed stationary source which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X	

III. NAME OF FACILITY

1 SKIP JOBAR. PACKAGING. INC.

IV. FACILITY CONTACT

A. NAME & TITLE (last, first, & title)	B. PHONE (area code & no.)
2 <u>KESSLER BARRY PRESIDENT</u>	<u>215</u> <u>598</u> <u>7141</u>

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX			
3 <u>270 STREET ROAD</u>			
B. CITY OR TOWN		C. STATE	D. ZIP CODE
4 <u>NEW HOPE</u>		<u>PA</u>	<u>18938</u>

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER			
5 <u>29 RIVERSIDE AVE BUILDING 7</u>			
B. COUNTY NAME			
<u>ESSEX</u>			
C. CITY OR TOWN		D. STATE	E. ZIP CODE
6 <u>NEWARK</u>		<u>NJ</u>	<u>07104</u>
F. COUNTY CODE (if known)			

SIC CODES (4-digit, in order of priority)

A. FIRST				B. SECOND			
2899 (specify) Chemical preparation mfrs., n.e.c.				74226 (specify) Warehouses (special) n.e.c.			
C. THIRD				D. FOURTH			
(specify)				(specify)			

OPERATOR INFORMATION

A. NAME						B. Is the name listed in Item VIII-A also the owner?	
JOBAR PACKAGING INC						<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	

C. STATUS OF OPERATOR (Enter the appropriate letter into the answer box, if "Other", specify.)				D. PHONE (area code & no.)			
F = FEDERAL S = STATE P = PRIVATE M = PUBLIC (other than federal or state) O = OTHER (specify) P (specify)				215 598 7141			

E. STREET OR P.O. BOX				F. CITY OR TOWN				G. STATE		H. ZIP CODE		IX. INDIAN LAND	
70 STREET ROAD				NEW HOPE				PA		18938		Is the facility located on Indian lands? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	

EXISTING ENVIRONMENTAL PERMITS

A. NPDES (Discharges to Surface Water)				D. PSD (Air Emissions from Proposed Sources)			
N				9 P			
B. UIC (Underground Injection of Fluids)				E. OTHER (specify)			
J				(specify)			
C. RCRA (Hazardous Wastes)				E. OTHER (specify)			
R				(specify)			

Attach to this application a topographic map of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements. **F9: A/50**

II. NATURE OF BUSINESS (provide a brief description)

At Jobar Packaging, Newark, NJ Plant, we package industrial chemicals, hazardous and non-hazardous classes from bulk (tanktrucks or railcars) directly into drums (mostly 55 gallon size) through a closed system. Our filling system is fully automatic. At the conclusion of each packaging run, we use steam to clean the lines and equipment. The washings are collected in our self-contained chemical sump. When necessary the contents of the sump which is typically 99% water is pumped out by an approved disposal firm for disposal in an approved manner.

F9: A/51

III. CERTIFICATION (see instructions)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

NAME & OFFICIAL TITLE (type or print)		B. SIGNATURE		C. DATE SIGNED	
Barry M. Kessler-President		<i>[Signature]</i>		11-11-81	

COMMENTS FOR OFFICIAL USE ONLY

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FORM 3
RCRA
EPA
U.S. ENVIRONMENTAL PROTECTION AGENCY
HAZARDOUS WASTE PERMIT APPLICATION
Consolidated Permits Program
(This information is required under Section 3005 of RCRA.)

I. EPA I.D. NUMBER
S N J D 0 0 0 7 2 9 7 8 0 3 1
1 2 3 4 5 6 7 8 9 10 11 12

FOR OFFICIAL USE ONLY

APPLICATION APPROVED	DATE RECEIVED (yr., mo., & day)	COMMENTS
	8 0 1 1 1 9	

II. FIRST OR REVISED APPLICATION

Place an "X" in the appropriate box in A or B below (mark one box only) to indicate whether this is the first application you are submitting for your facility or a revised application. If this is your first application and you already know your facility's EPA I.D. Number, or if this is a revised application, enter your facility's EPA I.D. Number in Item I above.

A. FIRST APPLICATION (place an "X" below and provide the appropriate date)

☒ **1. EXISTING FACILITY** (See instructions for definition of "existing" facility. Complete item below.)

☐ **2. NEW FACILITY** (Complete item below.)

FOR EXISTING FACILITIES, PROVIDE THE DATE (yr., mo., & day) OPERATION BEGAN OR THE DATE CONSTRUCTION COMMENCED (use the boxes to the left)

FOR NEW FACILITIES, PROVIDE THE DATE (yr., mo., & day) OPERATION BEGAN OR IS EXPECTED TO BEGIN

B. REVISED APPLICATION (place an "X" below and complete Item I above)

☐ **1. FACILITY HAS INTERIM STATUS**

☐ **2. FACILITY HAS A RCRA PERMIT**

III. PROCESSES - CODES AND DESIGN CAPACITIES

A. PROCESS CODE - Enter the code from the list of process codes below that best describes each process to be used at the facility. Ten lines are provided for entering codes. If more lines are needed, enter the code(s) in the space provided. If a process will be used that is not included in the list of codes below, then describe the process (including its design capacity) in the space provided on the form (Item III-C).

B. PROCESS DESIGN CAPACITY - For each code entered in column A enter the capacity of the process.

1. **AMOUNT** - Enter the amount.

2. **UNIT OF MEASURE** - For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.

PROCESS	PRO- CESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Storage:		
CONTAINER (barrel, drum, etc.)	S01	GALLONS OR LITERS
TANK	S02	GALLONS OR LITERS
WASTE PILE	S03	CUBIC YARDS OR CUBIC METERS
SURFACE IMPOUNDMENT	S04	GALLONS OR LITERS
Disposal:		
INJECTION WELL	D79	GALLONS OR LITERS
LANDFILL	D80	ACRE-FEET (the volume that would cover one acre to a depth of one foot) OR HECTARE-METER
LAND APPLICATION	D81	ACRES OR HECTARES
OCEAN DISPOSAL	D82	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	D83	GALLONS OR LITERS

Treatment:

PROCESS	PRO- CESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
TANK	T01	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	T02	GALLONS PER DAY OR LITERS PER DAY
INCINERATOR	T03	TONS PER HOUR OR METRIC TONS PER HOUR; GALLONS PER HOUR OR LITERS PER HOUR
OTHER (Use for physical, chemical, thermal or biological treatment processes not occurring in tanks, surface impoundments or inciner- ators. Describe the processes in the space provided; Item III-C.)	T04	GALLONS PER DAY OR LITERS PER DAY

UNIT OF MEASURE	UNIT OF MEASURE CODE	UNIT OF MEASURE	UNIT OF MEASURE CODE	UNIT OF MEASURE	UNIT OF MEASURE CODE
GALLONS	G	LITERS PER DAY	V	ACRE-FEET	A
LITERS	L	TONS PER HOUR	D	HECTARE-METER	F
CUBIC YARDS	Y	METRIC TONS PER HOUR	W	ACRES	B
CUBIC METERS	C	GALLONS PER HOUR	E	HECTARES	Q
GALLONS PER DAY	U	LITERS PER HOUR	H		

EXAMPLE FOR COMPLETING ITEM III (shown in line numbers X-1 and X-2 below): A facility has two storage tanks, one tank can hold 200 gallons and the other can hold 400 gallons. The facility also has an incinerator that can burn up to 20 gallons per hour.

DUP

13 14 15
1 1

LINE NUMBER	A. PRO- CESS CODE (from list above)	B. PROCESS DESIGN CAPACITY			FOR OFFICIAL USE ONLY	LINE NUMBER	A. PRO- CESS CODE (from list above)	B. PROCESS DESIGN CAPACITY			FOR OFFICIAL USE ONLY
		1. AMOUNT (specify)	2. UNIT OF MEAS- URE (enter code)					1. AMOUNT	2. UNIT OF MEAS- URE (enter code)		
X-1	S 0 2	600	G			5					
X-2	T 0 3	20	E			6					
	S 0 2	201,767000	G			7					
						8					
						9					
						10					

III. PROCESSES (continued)

SPACE FOR ADDITIONAL PROCESS CODES OR FOR DESCRIBING OTHER PROCESSES (code "T04"). FOR EACH PROCESS ENTERED HERE INCLUDE DESIGN CAPACITY.

IV. DESCRIPTION OF HAZARDOUS WASTES

EPA HAZARDOUS WASTE NUMBER — Enter the four-digit number from 40 CFR, Subpart D for each listed hazardous waste you will handle. If you handle hazardous wastes which are not listed in 40 CFR, Subpart D, enter the four-digit number(s) from 40 CFR, Subpart C that describes the characteristics and/or the toxic contaminants of those hazardous wastes.

ESTIMATED ANNUAL QUANTITY — For each listed waste entered in column A estimate the quantity of that waste that will be handled on an annual basis. For each characteristic or toxic contaminant entered in column A estimate the total annual quantity of all the non-listed waste(s) that will be handled which possess that characteristic or contaminant.

UNIT OF MEASURE — For each quantity entered in column B enter the unit of measure code. Units of measure which must be used and the appropriate codes are:

ENGLISH UNIT OF MEASURE **CODE**
 POUNDS P
 TONS T

METRIC UNIT OF MEASURE **CODE**
 KILOGRAMS K
 METRIC TONS M

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure taking into account the appropriate density or specific gravity of the waste.

PROCESSES**1. PROCESS CODES:**

For listed hazardous waste: For each listed hazardous waste entered in column A select the code(s) from the list of process codes contained in Item III to indicate how the waste will be stored, treated, and/or disposed of at the facility.

For non-listed hazardous wastes: For each characteristic or toxic contaminant entered in column A, select the code(s) from the list of process codes contained in Item III to indicate all the processes that will be used to store, treat, and/or dispose of all the non-listed hazardous wastes that possess that characteristic or toxic contaminant.

Note: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "000" in the extreme right box of Item IV-D(1); and (3) Enter in the space provided on page 4, the line number and the additional code(s).

2. PROCESS DESCRIPTION: If a code is not listed for a process that will be used, describe the process in the space provided on the form.

NOTE: HAZARDOUS WASTES DESCRIBED BY MORE THAN ONE EPA HAZARDOUS WASTE NUMBER — Hazardous wastes that can be described by more than one EPA Hazardous Waste Number shall be described on the form as follows:

1. Select one of the EPA Hazardous Waste Numbers and enter it in column A. On the same line complete columns B, C, and D by estimating the total annual quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.
2. In column A of the next line enter the other EPA Hazardous Waste Number that can be used to describe the waste. In column D(2) on that line enter "included with above" and make no other entries on that line.
3. Repeat step 2 for each other EPA Hazardous Waste Number that can be used to describe the hazardous waste.

EXAMPLE FOR COMPLETING ITEM IV (shown in line numbers X-1, X-2, X-3, and X-4 below) — A facility will treat and dispose of an estimated 900 pounds per year of chrome shavings from leather tanning and finishing operation. In addition, the facility will treat and dispose of three non-listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 100 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

LINE NO. (enter)	A. EPA HAZARDOUS WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEAS- URE (enter code)	D. PROCESSES	
				1. PROCESS CODES (enter)	2. PROCESS DESCRIPTION (if a code is not entered in D(1))
X-1	K 0 5 4	900	P	T 0 3 D 8 0	
X-2	D 0 0 2	400	P	T 0 3 D 8 0	
X-3	D 0 0 1	100	P	T 0 3 D 8 0	
X-4	D 0 0 2				included with above

EPA I.D. NUMBER (enter from page 1)													FOR OFFICIAL USE ONLY												
W N J D 0 0 0 7 2 9 7 8 0 3 1													W DUP 3 2 DUP												

IV. DESCRIPTION OF HAZARDOUS WASTES (continued)

LINE NO.	A. EPA HAZARD WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEA- SURE (enter code)	D. PROCESSES											
				1. PROCESS CODES (enter)						2. PROCESS DESCRIPTION (if a code is not entered in D(1))					
1	U 0 3 1	2,000 000	P	S	0	2									
2	U 0 4 4	2,500 000	P	S	0	2									
3	U 0 5 4	1,000 000	P	S	0	2									
4	U 1 3 4	300 000	P	S	0	2									
5	U 1 8 8	1,000 000	P	S	0	2									
6	D 0 0 1	3,000 000	P	S	0	2									
7	D 0 0 2	1,000 000	P	S	0	2									
8															
9															
10															
11															
12															
13															
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15															
16															
17															
18															
19															
20															
21															
22															
23															
24															
25															
26															

IV. DESCRIPTION OF HAZARDOUS WASTES (continued)

E. USE THIS SPACE TO LIST ADDITIONAL PROCESS CODES FROM ITEM D(1) ON PAGE 3.

EPA I.D. NO. (enter from page 1)													
S	F	N	J	D	O	O	0	7	2	9	7	T/A	C
1	2	3	4	5	6	7	8	9	10	11	12	13	14
36													

$$FG: \frac{A}{55}$$

$$FG: \frac{N}{56}$$

V. FACILITY DRAWING

All existing facilities must include in the space provided on page 5 a scale drawing of the facility (see instructions for more detail).

VI. PHOTOGRAPHS

All existing facilities must include photographs (aerial or ground-level) that clearly delineate all existing structures; existing storage, treatment and disposal areas; and sites of future storage, treatment or disposal areas (see instructions for more detail).

VII. FACILITY GEOGRAPHIC LOCATION

LATITUDE (degrees, minutes, & seconds)

40 45 53.0

LONGITUDE (degrees, minutes, & seconds)

074 09 34.0

VIII. FACILITY OWNER

☒ A. If the facility owner is also the facility operator as listed in Section VIII on Form 1, "General Information", place an "X" in the box to the left and skip to Section IX below.

B. If the facility owner is not the facility operator as listed in Section VIII on Form 1, complete the following items:

1. NAME OF FACILITY'S LEGAL OWNER

2. PHONE NO. (area code & no.)

3. STREET OR P.O. BOX

4. CITY OR TOWN

5. ST.

6. ZIP CODE

IX. OWNER CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME (print or type)

Barry M. Kessler

B. SIGNATURE



C. DATE SIGNED

11-17-80

X. OPERATOR CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME (print or type)

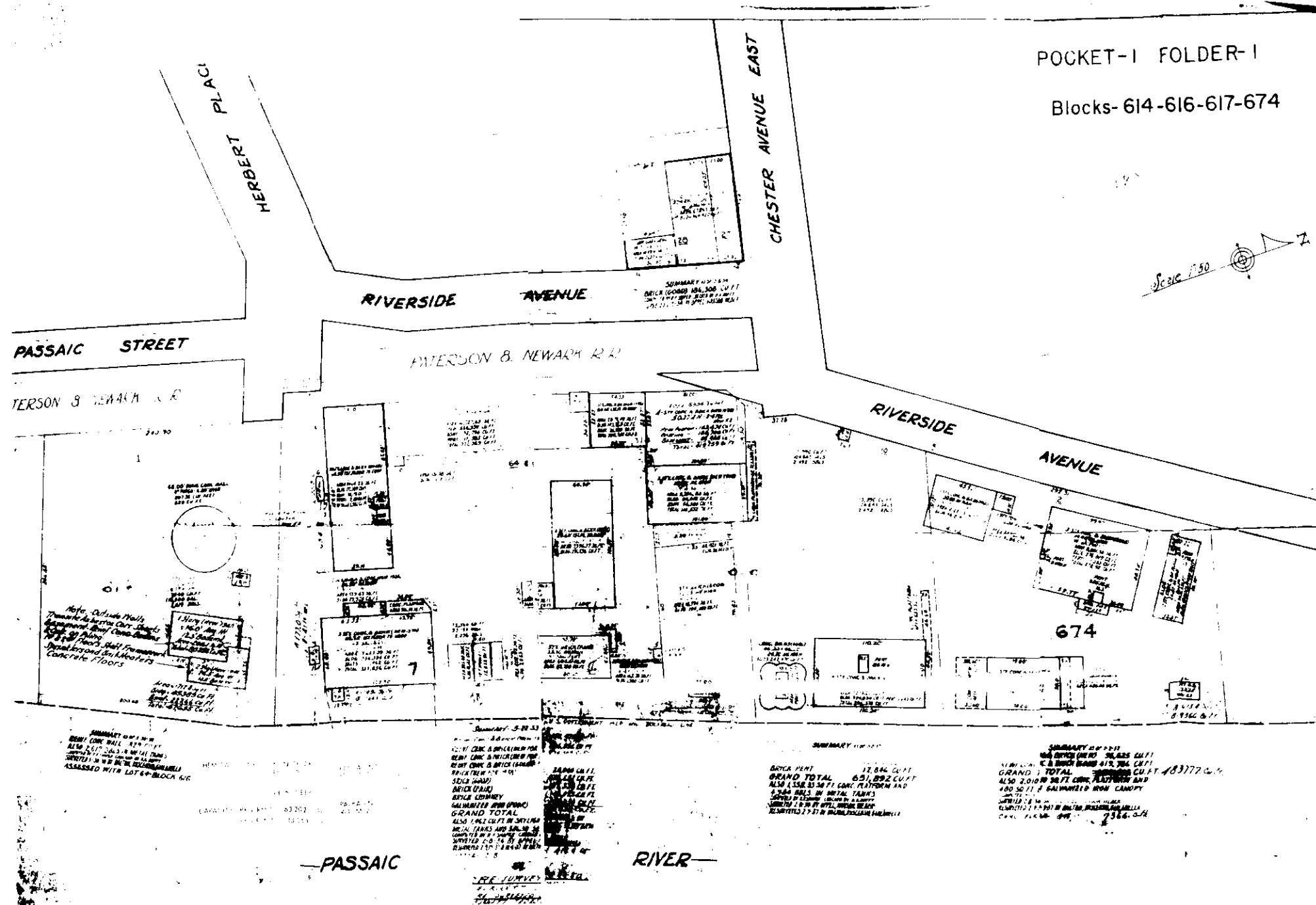
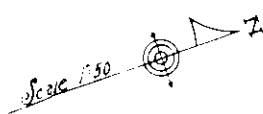
B. SIGNATURE

C. DATE SIGNED

45

POCKET-1 FOLDER-1

Blocks- 614-616-617-674



PASSAIC

RIVER

REFERENCE NO. 2



**ACKNOWLEDGEMENT OF NOTIFICATION
OF HAZARDOUS WASTE ACTIVITY
(VERIFICATION)**

This is to acknowledge that you have filed a Notification of Hazardous Waste Activity for the installation located at the address shown in the box below to comply with Section 3010 of the Resource Conservation and Recovery Act (RCRA). Your EPA Identification Number for that installation appears in the box below. The EPA Identification Number must be included on all shipping manifests for transporting hazardous wastes; on all Annual Reports that generators of hazardous waste, and owners and operators of hazardous waste treatment, storage and disposal facilities must file with EPA; on all applications for a Federal Hazardous Waste Permit; and other hazardous waste management reports and documents required under Subtitle C of RCRA.

EPA I.D. NUMBER

9JD000729780

INSTALLATION ADDRESS

**JOBAR PACKAGING INCORPORATED
270 STREET ROAD
NEW HOPE PA 18938**

**29 RIVERSIDE AVENUE BUILDING 7
NEWARK NJ 07104**

REFERENCE NO. 3

Name of Facility - ~~XXXXXX~~
RCRA ID# - ~~XXXXXX~~
Date of Inspection - ~~XXXXXX~~
Type of Inspection: Generator
Name of EPA/State Inspector - ~~XXXXXX~~

Transporter

TSD

19

NJ0000729780

Findings of Inspection: 7) ...
...
...

Action(s) Taken: none

Action(s) Recommended: none for above violations

NEW YORK COUNTY
CLERK
JUL 1 1980

RCRA GENERATOR INSPECTION FORM

450 000 72 978

COMPANY NAME: Tobac Packaging Inc.

EPA I.D. NUMBER: ~~W5200070772~~

COMPANY ADDRESS: ²⁹ Riverside AVE Building 1
Newark

COMPANY CONTACT OR OFFICIAL:

George Espinosa

INSPECTOR'S NAME: Bob Dante

TITLE: Operations Manager

BRANCH/ORGANIZATION: W5200070772

CHECK IF FACILITY IS ALSO A TSD
FACILITY ☒

DATE OF INSPECTION: 6-2-82

YES NO DON'T
KNOW

(1) Is there reason to believe that the facility has hazardous waste on site? yes

a. If yes, what leads you to believe it is hazardous waste?
Check appropriate box:

☒ Company admits that its waste is hazardous during the inspection.

☒ Company admitted the waste is hazardous in its RCRA notification and/or Part A Permit Application.

☒ The waste material is listed in the regulations as a hazardous waste from a nonspecific source (§261.31)

☐ The waste material is listed in the regulations as a hazardous waste from a specific source (§261.32)

☒ The material or product is listed in the regulations as a discarded commercial chemical product (§261.33)

☒ EPA testing has shown characteristics of ignitability, corrosivity, reactivity or extraction procedure toxicity, or has revealed hazardous constituents (please attach analysis report)

☐ Company is unsure but there is reason to believe that waste materials are hazardous. (Explain)

REC-115
JUL 20 2 10 PM '82
ENVIRONMENTAL ACTION
NEW YORK, N.Y. 10007

YES	NO	DON'T KNOW
-----	----	---------------

- b. Is there reason to believe that there are hazardous wastes on-site which the company claims are merely products or raw materials?

Please explain:

- c. Identify the hazardous wastes that are on-site, and estimate approximate quantities of each.

approx 2,000 gallon water and acid blends stored in an underground 100,000 gallon tank

- d. Describe the activities that result in the generation of hazardous waste.

Company takes materials in Bulk and transfer them to drums, when lines are flushed they go into an under ground tank

- (2) Is hazardous waste stored on site?

- a. What is the longest period that it has been accumulated?

1 1/2 years

- b. Is the date when drums were placed in storage marked on each drum?

NA

- (3) Has hazardous waste been shipped from this facility since November 19, 1980?

- a. If "yes," approximately how many shipments were made?

Zero

- (4) Approximately how many hazardous waste shipments off site have been made since November 19, 1980?

Zero

- a. Does it appear from the available information that there is a manifest copy available for each hazardous waste shipment that has been made?

- b. If "no" or "don't know," please elaborate.

	<u>YES</u>	<u>NO</u>	<u>DON'T KNOW</u>
c. Does each manifest (or a representative sample) have the following information?			
- a manifest document number	—	—	—
- the generator's name, mailing address, telephone number, and EPA identification number	—	—	—
- the name, and EPA identification number of each transporter	—	—	—
- the name, address and EPA identification number of the designated facility and an alternate facility, if any:	—	—	—
- a description of the wastes (DOT)	—	—	—
- the total quantity of each hazardous waste by units of weight or volume, and the type and number of containers as loaded into or onto the transport vehicle	—	—	—
- a certification that the materials are properly classified, described, packaged, marked, and labeled, and are in proper condition for transportation under regulations of the Department of Transportation and the EPA	—	—	—
(5) Were there any hazardous wastes stored on site at the time of the inspection?			
<i>Stored in under ground tank</i>	✓	—	—
a. If "yes," do they appear properly packaged (if in containers) or, if in tanks, are the tanks secure?	✓	—	—
<i>liquid test has remained constant</i>			
b. If not properly packaged or in secure tanks, please explain.			
c. Are containers clearly marked and labelled?	217	—	—
d. Do any containers appear to be leaking?	—	✓	—
e. If "yes," approximately how many?			

(6) Has the generator submitted an annual report to EPA covering the previous calendar year?

NE

a. How do you know?

(7) Has the generator received signed copies (from the TSD facility) of all manifests for wastes shipped off site more than 35 days ago?

NE

a. If "no," have Exception Reports been submitted to EPA covering these shipments?

(8) General comments.

RCRA TREATMENT, STORAGE AND DISPOSAL FACILITY INSPECTION FORM
FOR TSD FACILITIES ONLY

COMPANY NAME: Johns Packaging, Inc. EPA I.D. Number: _____

COMPANY ADDRESS: _____

NSD 000729780

COMPANY CONTACT OR OFFICIAL: _____

OTHER ENVIRONMENTAL PERMITS HELD

General Exposure

BY FACILITY: ☐ NPDES

TITLE: Operations Manager

☐ AIR

☐ OTHER

INSPECTOR'S NAME: John J. Smith

DATE OF INSPECTION: 6/2/87

BRANCH/ORGANIZATION: NSD

TIME OF DAY INSPECTION TOOK PLACE: 8:30 AM

(1) Is there reason to believe that the facility has hazardous waste on site? Yes

a. If yes, what leads you to believe it is hazardous waste?
Check appropriate box:

☒ Company admits that its waste is hazardous during the inspection.

☒ Company admitted the waste is hazardous in its RCRA notification and/or Part A Permit Application.

☒ The waste material is listed in the regulations as a hazardous waste from a nonspecific source (§261.31)

☐ The waste material is listed in the regulations as a hazardous waste from a specific source (§261.32)

☒ The material or product is listed in the regulations as a discarded commercial chemical product (§261.33)

☒ EPA testing has shown characteristics of ignitability, corrosivity, reactivity or extraction procedure toxicity, or has revealed hazardous constituents (please attach analysis report)

☐ Company is unsure but there is reason to believe that waste materials are hazardous. (Explain)

b. Is there reason to believe that there are hazardous wastes on-site which the company claims are merely products or raw materials?

YES NO DON'T KNOW

Please explain:

c. Identify the hazardous wastes that are on-site, and estimate approximate quantities of each.

2,000 gallons Acid water and Acids Blends

(2) Does the facility generate hazardous waste? Yes

(3) Does the facility transport hazardous waste? Yes

(4) Does the facility treat, store or dispose of hazardous waste? Yes

VISUAL OBSERVATIONS

- | | YES | NO | FOUNT
BROW |
|---|-------------------------------------|--------------------------|--------------------------|
| (5) <u>SITE SECURITY</u> (§265.14) | | | |
| a. Is there a 24-hour surveillance system? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Is there a suitable barrier which completely surrounds the active portion of the facility? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c. Are there "Danger-Unauthorized Personnel Keep Out" signs posted at each entrance to the facility? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| (6) Are there ignitable, reactive or incompatible wastes on site? (§265.27) | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| a. If "YES", what are the approximate quantities? | | | |
| b. If "YES", have precautions been taken to prevent accidental ignition or reaction of ignitable or reactive waste? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c. If "YES", explain | | | |
| d. In your opinion, are proper precautions taken so that these wastes do not: | | | |
| - generate extreme heat or pressure, fire or explosion, or violent reaction? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| - produce uncontrolled toxic mists, fumes, dusts, or gases in sufficient quantities to threaten human health? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| - produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosions? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| - damage the structural integrity of the device or facility containing the waste? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| - threaten human health or the environment? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Please explain your answers, and comment if necessary.

- e. Are there any additional precautions which you would recommend to improve hazardous waste handling procedures at the facility? *see*

- (7) Does the facility comply with preparedness and prevention requirements including maintaining: (§265.32)

YES NO DON'T
KNOW

- an internal communications or alarm system? ☒ YES ☐ NO ☐ DON'T KNOW
- a telephone or other device to summon emergency assistance from local authorities? ☒ YES ☐ NO ☐ DON'T KNOW
- portable fire equipment? ☒ YES ☐ NO ☐ DON'T KNOW
- adequate aisle space? ☒ YES ☐ NO ☐ DON'T KNOW
- in your opinion, do the types of wastes on site require all of the above procedures, or are some not needed? Explain. ☒ YES ☐ NO ☐ DON'T KNOW

This does affect the above

In your opinion, do the types of wastes on site require all of the above procedures, or are some not needed? Explain. *see above*

- * (3) Have you inspected to verify that the groundwater monitoring wells (if any) mentioned in the facility's groundwater monitoring plan (see no. 19 below) are properly installed? ☐ YES ☒ NO ☐ DON'T KNOW

If you have, please comment, as appropriate.

- (9) a. Is there any reason to believe that groundwater contamination already exists from this facility? ☐ YES ☒ NO ☐ DON'T KNOW
If "YES", explain.

- b. Do you believe that operation of this facility may affect groundwater quality? ☐ YES ☐ NO ☒ DON'T KNOW

- c. If "YES", explain.

RECORDS INSPECTION

- (10) Has the facility received hazardous waste from an off-site source since Nov. 19, 1980 (effective date of the regulations)? *NA* ☒ YES ☐ NO ☐ DON'T KNOW

- a. If "YES", does it appear that the facility has a copy of a manifest for each hazardous waste load received? ☐ YES ☐ NO ☐ DON'T KNOW

- b. How many post-November 19 manifests does it have? (If the number is large, you may estimate)

Zero at waste generated

- c. Does each manifest (or a representative sample) have the following information?

- a manifest document number

3

* This requirement applies only after November 19, 1981.

YES NO N/A

- the generator's name, mailing address, telephone number, and EPA identification number
- the name, and EPA identification number of each transporter
- the name, address and EPA identification number of the designated facility and an alternate facility, if any;
- a DOT description of the wastes
- the total quantity of each hazardous waste by units of weight or volume, and the type and number of containers as loaded into or onto the transport vehicle
- a certification that the materials are properly classified, described, packaged, marked, and labeled, and are in proper condition for transportation under regulations of the Department of Transportation and the EPA

d. Are there any indications that unmanifested hazardous wastes have been received since November 19, 1980? If YES, explain.

(11) Does the facility have a written waste analysis plan specifying test methods, sampling methods and sampling frequency? (§265.13)

- a. Does the character of wastes handled at the facility change from day to day, week to week, etc., thus requiring frequent testing?
(You may check more than one)
Waste characteristics vary _____
All wastes are basically the same _____
Company treats all waste as hazardous _____
Don't know _____

b. Does hazardous waste come to this facility from off-site sources?

c. If waste comes from an off-site source, are there procedures in the plan to insure that wastes received conform to the accompanying manifest?

(12) INSPECTIONS (§265.15)

a. Does the facility have a written inspection schedule?

b. Does the schedule identify the types of problems to be looked for and the frequency for inspections?

c. Does the owner/operator record inspections in a log?

d. Is there evidence that problems reported in the inspection log have not been remedied? If "YES," please explain.

(13) PERSONNEL TRAINING (§265.16)

a. Is there written documentation of the following:

- job title for each position at the facility related to hazardous waste management and the name of the employee filling each job? ☒
- type and amount of training to be given to personnel in jobs related to hazardous waste management? ☐
- actual training or experience received by personnel? ☐

(14) Does the facility have a written contingency plan for emergency procedures designed to deal with fires, explosion or any unplanned release of hazardous waste? ☒
(§265.51)

a. Does the plan describe arrangements made with local authorities? ☒

b. Has the contingency plan been submitted to local authorities? ☒

How do you know? *Five company inspectors
present on-site and has gone over
the plan*

c. Does the plan list names, addresses, and phone numbers of Emergency Coordinators? ☒

d. Does the plan have a list of what emergency equipment is available? ☒

e. Is there a provision for evacuating facility personnel? ☒

f. Was an Emergency Coordinator present or on call at the time of the inspection? ☒

(15) Does the owner/operator keep a written operating record with: (§265.73)

- a description of wastes received with methods and dates of treatment, storage or disposal? ☒

- location and quantity of each waste? ☒

- detailed records and results of waste analysis and treatability tests performed on wastes coming into the facility? ☒

- detailed operating summary reports and description of all emergency incidents that required the implementation of the facility contingency plan? ☒

(16) Does the facility have written closure and post-closure plans? (§265.110) ☒

a. Does the written closure plan include:

- a description of how and when the facility will be partially (if applicable) and ultimately closed? ☐

* Effective date for this requirement is May 19, 1981.

- an estimate of the maximum inventory of wastes in storage or treatment at any time during the life of the facility? ___
- a description of the steps necessary to decontaminate facility equipment during closure? ___
- a schedule for final closure including the anticipated date when wastes will no longer be received and when final closure will be completed? ___
- b. What is the anticipated date for final closure? ___
- fc. Does the owner/operator have a written post-closure plan identifying the activities which will be carried on after closure and the frequency of these activities? rf ___
- d. Does the written post-closure plan include: ___
 - a description of planned groundwater monitoring activities and their frequencies during post-closure? ___
 - a description of planned maintenance activities and frequencies to ensure integrity of final cover during post-closure? ___
 - the name, address and phone number of a person or office to contact during post-closure? ___
- *(17) Does the owner/operator have a written estimate of the cost of closing the facility? (§265.142) What is it? ___ ✓ ___
- *(18) Does the owner/operator have a written estimate of the cost for post-closure monitoring and maintenance? What is it? (§265.144) rf ___
- *(19) Has a groundwater monitoring plan been submitted to the Regional Administrator for facilities containing a surface impoundment, landfill or land treatment process? (This requirement does not apply to recycling facilities.) (§265.90) rf ___
 - a. Does the plan indicate that at least one monitoring well has been installed hydraulically upgradient from the limit of the waste management area? ___
 - b. Does the plan indicate that there are at least three monitoring wells installed hydraulically downgradient at the limit of the waste management area? ___

† This section applies only to disposal facilities.

* Effective date for this requirement is May 19, 1981.

SITE SPECIFIC

Please circle all appropriate activities and answer questions on indicated pages for all activities circled. When you submit your report, include only those site-specific pages that you have used.

<u>STORAGE</u>	<u>TREATMENT</u>	<u>DISPOSAL</u>
Waste Pile p. 9	Tank p. 8	Landfill pp. 10-11
Surface Impoundment p. 8	Surface Impoundment pp. 8-9	Land Treatment pp. 9, 10
Container p. 7	Incineration pp. 12-13	Surface Impoundment p. 8
Tank, above ground p. 8	Thermal Treatment pp. 12-13	Other _____
<u>Tank, below ground p. 8</u>	Land Treatment pp. 9-10	
Other _____	Chemical, Physical p. 13 and Biological Treatment (other than in tanks, surface impoundment or land treatment facilities)	YES NO DON'T KNOW
	Other _____	

CONTAINERS (\$265.170)

- Are there any leaking containers?
If "YES", explain. _____
- Are there any containers which appear in danger of leaking?
If "YES", explain. _____
- Do wastes appear compatible with container materials? _____
- Are all containers closed except those in use? _____
- Do containers appear to be opened, handled or stored in a manner which may rupture the containers or cause them to leak? _____
- How often does the plant manager claim to inspect container storage areas? _____
- Does it appear that incompatible wastes are being stored in close proximity to one another?
If "YES", explain. _____
- Are containers holding ignitable or reactive wastes located at least 15 meters (50 feet) from the facility's property line? _____
- What is the approximate number and size of containers with hazardous wastes? _____

TANKS (\$265.190)

YES

NO

DON'T
KNOW

1. Are there any leaking tanks?
If "YES", explain.

— ☒ —

2. Are there any tanks which appear in danger of leaking?
If "YES", explain.

— ☒ —

3. Are wastes or treatment reagents being placed in tanks which could cause them to rupture, leak, corrode or otherwise fail?
If "YES", explain.

— ☒ —

4. Do uncovered tanks have at least 2 feet of freeboard or an adequate containment structure?

☒ — —

5. Where hazardous waste is continuously fed into a tank, is the tank equipped with a means to stop this inflow?

— ☒ —

6. Does it appear that incompatible wastes are being stored in close proximity to one another, or in the same tank?
If "YES", explain.

— ☒ —

7. How often does the plant manager claim to inspect container storage areas?

weekly

8. Are ignitable or reactive wastes stored in a manner which protects them from a source of ignition or reaction?
If "YES", explain.

— ☒ —

9. What is the approximate number and size of tanks containing hazardous wastes?

1, 10000 gallon underground tank

SURFACE IMPOUNDMENTS (\$265.220)

1. Is there at least 2 feet of freeboard in the impoundment?

— — —

2. Do all earthen dikes have a protective cover to preserve their structural integrity?
If "YES", specify type of covering

— — —

3. Is there reason to believe that incompatible wastes are being placed in the same surface impoundment?
If "YES", explain.

— — —

4. Are ignitable or reactive wastes being placed in surface impoundments without being treated to remove these characteristics?
If "YES", explain.

5. Are there any leaks, failures or is there any deterioration in the impoundments?
If "YES", explain.

6. Give the approximate size of surface impoundments (gallons or cubic feet).

WASTE PILES (\$265.250)

1. Is the waste pile protected from wind erosion?
a. Does it appear to need such protection?
b. Explain what type of protection exists.
2. Does it appear that incompatible wastes are being stored in the same waste pile?
If "YES", explain.
3. Is leachate run-off from a pile a hazardous waste?
If "YES", explain this determination and answer (a) and (b) below.
a. Is the pile placed on an impermeable base that is compatible with the waste?
b. Is the pile protected from precipitation and run-on?
4. In your judgment, are ignitable or reactive wastes managed in such a way that they are protected from any material or conditions which may cause them to ignite?
Please explain or indicate if no such wastes are present.

Are they placed on an existing pile so that they no longer meet the definition of ignitable or reactive waste?
Please explain.

5. How many waste piles are on site, and approximately how large are they?

LAND TREATMENT (\$265.270)

1. Can the facility operator demonstrate that the hazardous waste has been made less or non-hazardous by biological degradation or chemical reactions occurring in or on the soil?
Please explain.

- | | | | |
|---|-----|-----|-----|
| 2. Is run-on diverted away from the active portions of the land treatment facility? | ___ | ___ | ___ |
| 3. Is run-off collected? | ___ | ___ | ___ |
| 4. Are food chain crops being grown on the facility property? | ___ | ___ | ___ |
| a. If "YES", can the facility operator document that arsenic, lead and mercury: | | | |
| - will not be transferred to the crop or ingested by food chain animals or | ___ | ___ | ___ |
| - will not occur in greater concentrations in the crops grown on the land treatment facility than in the same crops grown on untreated soils. | ___ | ___ | ___ |
| b. Has notification of the growing of the food chain crops been made to the Regional Administrator? | ___ | ___ | ___ |
| 5. Is there a written and implemented plan for unsaturated zone monitoring? | ___ | ___ | ___ |
| 6. Are there records of the application dates, application rates, quantities and location of each hazardous waste placed in the facility? | ___ | ___ | ___ |
| 7. Do the closure and post-closure plans address: | | | |
| a. control of migration of hazardous wastes into the groundwater? | ___ | ___ | ___ |
| b. control of run-off, release of airborne particulate contaminants? | ___ | ___ | ___ |
| c. compliance with requirements for the growth of food-chain crops (if they are present)? | ___ | ___ | ___ |
| 8. Is ignitable or reactive waste immediately incorporated into the soil so the resulting waste no longer meets that definition? If "YES", explain. | ___ | ___ | ___ |
| 9. Are incompatible wastes placed in the same land treatment area? If "YES", explain. | ___ | ___ | ___ |
| 10. What is the area of the land receiving hazardous waste treatment? | ___ | ___ | ___ |

LANDFILLS (\$265,500)

- | | | | |
|---|-----|-----|-----|
| 11. Is run-on diverted away from the active portions of the landfill? | ___ | ___ | ___ |
| 12. Is run-off from active portions of the landfill collected? | ___ | ___ | ___ |

* Effective date for these requirements is May 15, 1981.

† These requirements are effective November 19, 1981.

3. Is waste which is subject to wind dispersal controlled?
Explain.

4. Does the owner/operator maintain a map with:

- the exact location and dimensions of each cell

- the contents of each cell and approximate location of each hazardous waste type

5. Do the closure and post-closure plans address:

- control of pollutant migration via ground water?

- control of surface water infiltration?

- prevention of erosion?

6. Is ignitable or reactive waste treated before being placed in the landfill?
Explain how you know.

7. Are precautions taken to insure that incompatible wastes are not placed in the same landfill cell?
If "NO", explain.

8. Are bulk or non-containerized wastes containing free liquids placed in the landfill?
If "YES",

a. Does the landfill have a liner which is chemically and physically resistant to the added liquid?

b. Is the waste treated and stabilized so that free liquids are no longer present?

9. Are containers holding liquid waste or waste containing free liquids placed in the landfill?

10. Are empty containers (e.g. those containing less than 1/2 inch of liquid) placed in the landfill?

If so, are they crushed flat, shredded or similarly reduced in volume before they are buried?

11. What is the approximate area of the hazardous waste landfill?

* Effective date for this requirement is December 19, 1981.

a. If "YES", what is being burned?
(only burning or detonation
of explosives is permitted)

b. If open burning or detonation of explosives is taking
place, approximately what is the distance from the open
burning or detonation to the property of others?

YES NO DON'T
KNOW

6. Does the incinerator appear to be operating
properly? (Do emergency shutdown controls
and system alarms seem to be in good working
order?) Please explain.

a. Is there any evidence of fugitive emissions?

7. Is the residue from the incinerator treated
by the owner as a hazardous waste?
Please explain.

8. What types of air pollution control devices (if any)
are installed on the incinerator?

CHEMICAL, PHYSICAL AND BIOLOGICAL TREATMENT (\$265,400)

1. Does the treatment process system show any
signs of ruptures, leaks, or corrosion?
Please explain.

2. Is there a means to stop the inflow of
continuously-fed hazardous wastes?

3. Is there ignitable or reactive waste fed
into the treatment system?

If "YES", has it been treated or protected
from any material or conditions which may
cause it to ignite or react? If so,
explain how.

Are the incompatible wastes placed in
the same treatment process?
If "YES", explain.

5. Describe the treatment system at this facility.

INCINERATORS AND THERMAL TREATMENT
(55255.140 AND 265.379)

YES NO DON'T
KNOW

1. What type of incinerator or thermal treatment is at the site (e.g. waterwall incinerator, boiler, fluidized bed, etc.)?

2. Was hazardous waste being incinerated or thermally treated during your inspection?
If "YES", answer all following questions.
If "NO", answer only questions 3 and 7.

3. Has waste analysis been performed (and written records kept) to include:

- heating value of the waste
- halogen content
- sulfur content
- concentration of lead
- concentration of mercury

NOTE: Waste analysis need not be performed on each waste load if if there are documented data available to show waste characteristics that do not vary. If there are such documented data available, check here ☐.

4. Does it appear that the owner/operator brings his thermal treatment process to steady state (normal) conditions of operation before introducing hazardous wastes?

5. Did it appear during your inspection that there was adequate monitoring and inspection by owner/operator every 15 minutes during hazardous waste incineration for:

- waste feed
- auxiliary fuel feed
- air flow
- incinerator temperature
- scrubber flow
- scrubber pH
- relevant level controls

- every hour for:

- stack plume (color and opacity)

5. Is there open burning of hazardous waste?

REFERENCE NO. 4

JOBAR PACKAGING and WAREHOUSING, INC.

29 Riverside Avenue
Newark, New Jersey 07104

02/15/83

February 15, 1983

Mr. Conrad Simon
Director, Air and Wastemanagement Div.
U.S. Environmental Protection Agency
Region II
26 Federal Plaza
New York, NY 10278

Re: EPA I.D. No. NJD000729780

Dear Mr. Simon:

Pursuant to your letter of 1/31/83 (copy attached), please be advised of the following:

Jobar Packaging, Inc. is no longer a viable, operating company having made an Assignment for the Benefit of Creditors in the State of New Jersey, effective 10/31/82. In effect, Jobar went bankrupt.

*JH
HUMS
2/23/83*

Last July, I had several conversations with Mr. Tom Taccone of the EPA, Region II Permits Administration Branch. I had commented to Mr. Taccone that upon closer scrutiny, I felt Jobar either did not meet the definition of a TSD facility or that my original permit application was in error. Upon receiving the 1/31/83 letter from your office, I again spoke with Mr. Taccone on 2/14/83. He advised I send him a copy of this letter explaining our position.

My feeling that Jobar doesn't meet the definition of a TSD facility is based on the "Characteristics of Hazardous Waste" contained in Subpart C of Part 261 of the Federal Regulations. I have enclosed copies of my original permit applications for reference. My confusion in submitting the original applications resulted from my classifying the aqueous, filling-line washings referred to on EPA Form 3510-1, as being ignitable, corrosive and toxic. This classification was reported on EPA Form 8700-12. I made the mistake of thinking the hazard classification applied to the pure chemicals Jobar was packaging, instead of to the 99% water filling-line washings which exhibit none of these hazardous characteristics.

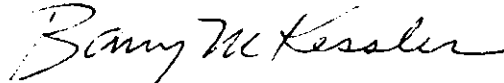
It is perhaps noteworthy that during an active day of packaging no more than 30 gallons of 99% water line washings were generated. Jobar operated 5 days per week/52 weeks per year.

Based on the above comments, I feel your letter of 1/31/83 is not applicable as it applied to Jobar. I would like to point out, however, that it is my understanding a company named Frey Industries, Inc. is now operating in the plant facilities that were previously operated by Jobar, at 29 Riverside Avenue,

Mr. Conrad Simon- U.S. Environmental Protection Agency-Feb. 15, 1983- Page 2

Newark, New Jersey. Frey Industries, I believe, is also a chemical packaging company. If you have any questions concerning this situation, please contact me, at 215-598-7141.

Very truly yours,

A handwritten signature in cursive script, reading "Barry M. Kessler".

Barry M. Kessler

cc: Mr. Tom TaCcone
U.S. Environmental Protection Agency
Region II
Permits Administration Branch
26 Federal Plaza
New York, NY 10278

REFERENCE NO. 5



State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES
P. O. BOX 2809
TRENTON, NEW JERSEY 08625

November 12, 1980

Mr. Kessler
JOBAR Packaging Inc.
270 Street Road
New Hope, Pennsylvania 18938

Dear Mr. Kessler:

This is in reply to your inquiry concerning wells within a
 $\frac{1}{4}$ mile of your property in Newark.

Enclosed are two well records for industrial wells on Verona
Avenue. These are the only wells we have reports for and they do
not use the water for potable purposes. We have no records of
wells for potable supplies within the area.

If I may be of further assistance, feel free to contact
me again.

Sincerely yours,

Carol S. Lucey
Carol S. Lucey
Supervising Geologist

CSL:lf
Enclosures

WELL RECORD

- OWNER Seton Leather Company ADDRESS 62 Varona Ave. Newark, N. J.
Owner's Well No. 3 SURFACE ELEVATION Feet
(above mean sea level)
- LOCATION Above Address
- DATE COMPLETED 6 - 20 - 54 DRILLER Parkhurst Well & Pump Company
- DIAMETER: Top 12 Inches Bottom 2 Inches TOTAL DEPTH 400 Feet
- CASING: Type Steel Pipe Diameter 10 Inches Length 95 Feet
- SCREEN: Type None Size of Opening Diameter Inches Length Feet
Range in Depth { Top Feet Geologic Formation Limerick
Bottom Feet
Tail piece: Diameter Inches Length Feet
- WELL FLOWS NATURALLY 10 Gallons per Minute at Feet above surface
Water rises to Feet above surface
- RECORD OF TEST: Date 6 - 20 - 54 Yield 100 Gallons per minute
Static water level before pumping Feet below surface
Pumping level feet below surface after 8 hours pumping
Drawdown Feet Specific Capacity 10 Gals. per min. per ft. of drawdown
How Pumped Electric How measured Orifice
Observed effect on nearby wells
- PERMANENT PUMPING EQUIPMENT:
Type 1 1/2" Turbine Capacity 100 Gallons per minute
How Driven Electric Horse Power 20 R.P.M. 1725
Depth of pump in well 200 Feet Depth of Foot piece in well 15 Feet
Depth of Air Line in well 15 Feet Type of Meter on Pump
- USED FOR Industrial
AMOUNT { Average Gallons Daily
Maximum Gallons Daily
- QUALITY OF WATER --- Sample: Yes No
Taste Odor Color Temperature °F
- LOG See Other Side Are samples available?
(Give details on back of sheet or on separate sheet)
- SOURCE OF DATA Our Files
- DATA OBTAINED BY Our Drillers DATE October 1, 1954

Permit No. 26-2-1
Application No. _____
County Essex

THE UNIVERSITY OF CHICAGO

REFERENCE NO. 6



State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL QUALITY
JOHN FITCH PLAZA, CN027, TRENTON, N.J. 08625

June 3, 1982

Mr. Barry Kessler
Jobar Packaging & Warehousing
P. O. Box 394
Kearny, N. J. 07032

REFERENCE: Our 6-2-82 Telephone Conversation

Dear Mr. Kessler:

As you requested, I am notifying you of the status of two air pollution permit applications.

Company Name: Jobar Packaging & Warehousing
Company Location: Newark

<u>DESIGNATION</u>	<u>LOG #</u>	<u>STATUS</u>
Fume Scrubber	81-236	90 day
Steam Boiler	81-237	05 year

Due to our computer procedures we are unable to issue the approval form letter at this time. However, this letter is equivalent to the form letter. It is intended to notify you of our action and serve as an approval letter until the form letter is processed and issued. The form letter will include your permit and certificate number and New Jersey stack identification number. It will be sent to you within several weeks.

Very truly yours,

Thomas A. Micai

Thomas Micai Asst. Supervisor
New Source Review Section
Bureau Air Pollution Control

WPH:TM:BBW

RECEIVED
June 6-8-82

REFERENCE NO. 7

Jobar Packaging & Warehousing, Inc.

P.O. BOX 394
KEARNY, NEW JERSEY 07032

TELEPHONE: (201) 482-0153

TELEX: 138046 JOBAR NWK

June 24, 1982

State of New Jersey
Dept. of Environmental Protection
Division of Environmental Quality
1100 Raymond Blvd. - Room 115
Newark, New Jersey 07102

Dear Mr. Bara:

This letter will confirm our telephone conversation today regarding the violation notice sent to us June 16, 1982 relative to our facility at 29 Riverside Avenue, Newark, New Jersey.

Please find enclosed a check in the amount of \$200. and a copy of a June 3, 1982 letter sent to us by Mr. Thomas Micai of your department in Trenton. We assume this letter regarding our permit application will remove the fume scrubber and steam boiler from the three-point violation notice.

The third violation cited involves a drum filler/hopper apparatus used for dry, free-flowing chemical materials. We have retained a consulting chemical engineer, Mr. Harry Betzig to evaluate this situation and to ensure conformance with New Jersey air quality provisions; however, we would appreciate a 90-day extension of the violation order to allow us time to complete engineering plans and submit the required permit applications.

Thank you very much for your consideration in this matter.

Very truly yours,

Barry M. Kessler
Barry M. Kessler *JK*

BMK/

cc: D. Ahearn
J. Espinosa
T. Frey

cc: Thomas A. Pluta
State of New Jersey
Dept. of Environmental Protection
John Fitch Plaza, CN027
Trenton, New Jersey 08625

• SPECIALIZING IN CHEMICAL PACKAGING, WAREHOUSING & DISTRIBUTION SERVICES •

29 RIVERSIDE AVENUE
NEWARK, N.J. 07104

1875 McCARTER HIGHWAY
NEWARK, N.J. 07104

Jobar Packaging and Warehousing, Inc.
P.O. BOX 394
KEARNY, N.J. 07032

EXPLANATION	AMOUNT

55-368
212

3119

PAY
AMOUNT
OF

200 DOLS 00 CTS

DOLLARS

CHECK
AMOUNT

DATE	TO THE ORDER OF	DESCRIPTION	CHECK NUMBER	CHECK AMOUNT
6/28/82	N.J. STATE DEPT. OF ENVIRONMENTAL PROTECTION		3119	\$ 200.00

JOBAR PACKAGING AND WAREHOUSING, INC.

THE FIRST NATIONAL BANK AND TRUST COMPANY
KEARNY, N.J. 07032

Robert B. Frey
AUTHORIZED SIGNATURE

⑆021203682⑆

263 642 5⑈

RECORD OF PAYMENT

0

6/28/62 N.D. STATE DEPT. OF ENVIRONMENTAL

3119

200 00

NON - NEGOTIABLE

REFERENCE NO. 8

FORM 1
EPA
GENERAL
ENVIRONMENTAL PROTECTION AGENCY
GENERAL INFORMATION
Consolidated Permits Program
(Read the "General Instructions" before starting.)

I. EPA I.D. NUMBER
NJ D000729780

III. FACILITY NAME
FREY INDUSTRIES, INC.

V. FACILITY MAILING ADDRESS
29 RIVERSIDE AVE
PLEASE PLACE LABEL IN THIS SPACE
NEWARK, N.J. 07104

VI. FACILITY LOCATION
32 0 184

I. EPA I.D. NUMBER
NJ D000729780

GENERAL INSTRUCTIONS
If a preprinted label has been attached to this form, it is the designated space. Review the information carefully. If any of the information is incorrect, through it and enter the correct information in the appropriate fill-in area below. If the information on the preprinted data is correct (the area on the left of the label above lists the information that should appear), please provide it in the proper fill-in area below. If the information is incorrect, please provide the correct information in the appropriate fill-in area below.

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any of the questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the appropriate box. If the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may submit any form if your facility is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of listed pollutants.

SPECIFIC QUESTIONS	MARK "X"			SPECIFIC QUESTIONS	MARK "X"		
	YES	NO	FORM ATTACHED		YES	NO	FORM ATTACHED
1. Does your facility produce, process, or use any of the following listed pollutants?	X			1. Does or will this facility include a wastewater treatment system?	X		
2. Does your facility currently result in discharges of listed pollutants to the U.S. other than those described in Section 302 of the CWA?	X			2. Is this a preexisting facility (as defined in Section 302 of the CWA)?	X		
3. Does your facility treat, store, or dispose of listed pollutants (FORM 3)?	X			3. Do you or your municipal official own, lease, or control any underground storage tank?	X		
4. Does your facility store any produced or extracted listed pollutants on or near the surface of the ground or in any underground storage tank?	X			4. Do you or your municipal official own, lease, or control any underground storage tank?	X		
5. Does your facility store any listed pollutants in any above ground storage tank?	X			5. Is this facility a preexisting facility (as defined in Section 302 of the CWA)?	X		

III. NAME OF FACILITY
FREY INDUSTRIES INC.

IV. FACILITY CONTACT

A. NAME & TITLE (last, first, & title)
TILGHMAN B FREY PRESIDENT

B. PHONE (area code & number)
201 482 0153

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX
PO BOX 9307

B. CITY OR TOWN
NEWARK

C. STATE
NJ

D. ZIP CODE
07104

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER
29 RIVERSIDE AVE.

B. COUNTY NAME
ESSEX

C. CITY OR TOWN
NEWARK

D. STATE
NJ

E. ZIP CODE
07104

VII. SIC CODES (4-digit, in order of priority)

A. FIRST

(specify)

B. SECOND

(specify)

(specify)

(specify)

VIII. OPERATOR INFORMATION

A. NAME

FREY INDUSTRIES INC.

P

(specify)

PRIVATE

201 482 0153

PO BOX 9307

NEWARK

NJ 07104

06175

(specify)

(specify)

IX. MAP

Attach to this application a graphic map of the area extending to at least one mile beyond the outline of the facility, showing the location of each of its existing and proposed intake and discharge points, each treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all major water bodies in the map area. See instructions for precise requirements.

XII. NATURE OF BUSINESS (provide a brief description)

Package, drum and warehouse various products for the chemical industry. Operate as a general warehouse and distribution facility for finished product delivered to us from various industries throughout the world.

I, the undersigned, declare under penalty of perjury that I have personally examined and am familiar with the contents of this application and that, based on my inquiry of those persons immediately responsible for the preparation of this application, I believe that the information is true, accurate and complete. I am aware that there are severe penalties for providing false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE (type or print)

B. SIGNATURE

C. DATE SIGNED

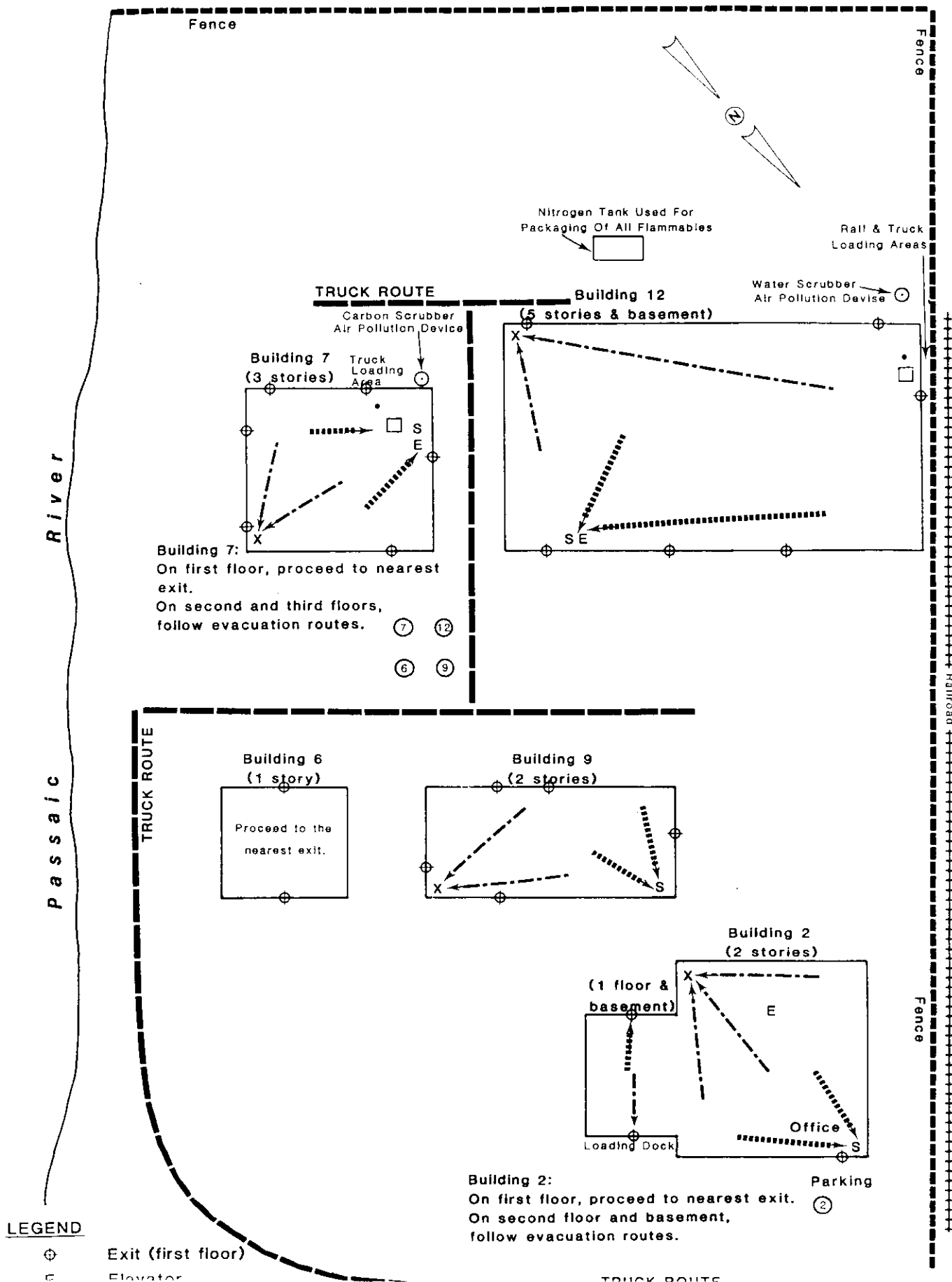
TILAHMAN B. FREY, PRESIDENT

Tilman B. Frey

8/1/84

XIII. FOR OFFICIAL USE ONLY

SITE MAP FOR FREY INDUSTRIES, INC.



REFERENCE NO. 9

07-14-62

07-14-62

MEMO

NEW JERSEY STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION

TO BHWE file Through Y.E. Velez DATE 3/28/88FROM Chris FelicettiSUBJECT STATUS of Frey Industries Inc. NJD CCC 724780

The RCRA inspection of this facility in 4/2/87 found the facility to be conducting some TSD activities, but mostly was a generator due to spill cleanup activity of hazardous substances warehoused there. The facility requested TSD delisting in 1984. According to the report, no formal closure has been done.

REFERENCE NO. 10

INSPECTION REPORT

REPORT PREPARED FOR:

- ☒ Generator
☐ Transporter
☐ HWM (TSD) Facility

FACILITY INFORMATION

Name: Frey Industries Inc (formerly Tebow Packaging)
Address: 29 Riverside Ave, Bldg 7, Newark NJ.
Lot: 1 Block: 614
County: Essex
Phone: 201-482-0153
EPA ID #: NTD 000 729780
Date of Inspection: 4-2-87

PARTICIPATING PERSONNEL

State or EPA Personnel:

WAYNE GREEN

Facility Personnel:

Tilghman B. Frey
President

Report Prepared by Name:

WAYNE GREEN

Region:

METRO

Telephone #:

201-669-3960

Reviewed by:

Jacob Emilio Yacobi

Date of Review:

05-04-87

FACILITY NAME: Frey Industries

ADDRESS: 2 Riverside Ave.

Newark, NJ

TIME IN: 1005

COUNTY: Essex

TIME OUT: 1420

EPA ID: NJDO000729780

DATE OF INSPECTION: 4-2-87

PHOTOS TAKEN

☐ YES

☒ NO

If yes, how many? 0

SAMPLE TAKEN

☐ YES

☒ NO

NO. OF SAMPLES 0

NJDEP ID # _____

MANIFESTS REVIEWED

☒ YES

☐ NO

Number of manifests in compliance 0

Number of manifests not in compliance 2

List manifest document numbers of those manifests not in compliance.

NJ A 0230707 (1-21-87)

NJ 0016047 (9/11/86)

SUMMARY OF FINDINGS

FACILITY DESCRIPTION AND OPERATIONS

On 4/2/87 a RCRA inspection was conducted at Freys Industries Inc, formerly Tobac packaging of Newark, New Jersey. This inspection was conducted by NJ DEP personnel Wayne Green. The facility personnel representing Frey Industries on this inspection was Tilghman B. Frey, President.

Finished products are brought to Freys in bags, steel drums ^{and} fiber drums. Raw ~~is from~~ materials are from approximately 70 customers. Such customers include Ashland Chemical, BASF, Mobay Chemicals and Monsanto. Most products from these customers are warehoused until request is received for shipment.

Rail cars, tank-trucks and Isotanks (tanks from ships) are also received at Frey's, Newark facility. Products are usually removed from these containers ~~for shipment~~ to 55 gal ~~drums~~ ^{drums}. At times materials may also be removed from 55 gal ~~drums~~ drums and transferred to rail cars, tank-trucks or isotanks.

Frey industries does not own any of these products. All products warehoused, packaged and distributed by Freys are eventually sold/shipped under owners (customers) ^{Frey's} name.

The products that are warehoused at Freys include polyester resins, belonging to Ashland ^{Chemical}, Flammable liquids,

-A-

SUMMARY OF FINDINGSFACILITY DESCRIPTION AND OPERATIONS

acids, bases, corrosives and poisons are also handled at Freys Newark facility. All items are assigned a lot number with respect to their accounts. The rail cars are usually from Monsanto and may contain Orthodichlorobenzene (ONCB) and paratrichlorobenzene (PNCB). These are two class-B poisons that go to agricultural fields in Europe and may also be used for cleansing operations in wool manufacture. Paratrichlorobenzene is usually shipped in isotanks for Monsanto.

The isotanks received by Frey Industries may be from as far away as Europe and may contain 1) Butylene Oxide 2) Cyclohexane 3) Dimethylamino polyamine (4) Morpholine. Such materials are usually drummed for BASF. At times Acetyl chloride is dedrummed (from drum) to tanks for American Hoechst. Diethyl Sulfate is also drummed to tanks for Aceto Corporation. Cresylic Acid (for petroleum industry) may also be drummed or dedrummed for General Electric (G-E).

Whenever lines are steam cleaned at Frey Industries the resulting condensate is stored in 55 gal drums until another batch of the same material arrives for drumming.

Lines are normally steam-cleaned at the end of each batch of a particular material. When this occurs the owner of the material takes a sample of the condensate to determine its purity. If it meets desired specification incoming batch of raw material is added to condensate in 55 gal drum until filled.

-A-

SUMMARY OF FINDINGS

FACILITY DESCRIPTION AND OPERATIONS

The drum is then shipped with other drums of raw material from the new batch. Frey Industries keeps records of these drums with ^{condensate plus raw} material ~~steam cleaned~~ new batch materials. According to Mr Frey the records for these drums indicate 'filling of partial drums'. (Copies of such records are ^{to be sent} ~~expected~~ to this Office by Mr Frey).

Waste is generated at Frey Industries whenever spilled materials are cleaned up. Presently floor sweepings are not treated as hazardous. Packaging and repackaging of hazardous material ^{at Frey's} result in small quantities being spilled onto the floor and the President was advised by NJDEP personnel to classify floor sweepings as hazardous waste and manage it accordingly. Frey has also been advised to desist from being a repackager of hazardous waste for other companies who need ^{such} assistance from time to time. This packaging of hazardous waste by Frey ^{Industries} involved the removal of such waste from actual generation site to Frey's Industries Newark facility where waste would be adequately containerized ^{and} prepared for disposal ^(see attached documents re BASF Wyandotte Corp and Frey Industries). This activity classifies Frey ^{Industries} as TSD but since Frey Industries acted as a "good guy" a ^{and no NOV} verbal warning was issued to company when NJDEP held meeting with Frey Industries and its Attorney days before this inspection. Presently on site at the facility is an ~~an~~ underground ^{concrete} storage

-A-

SUMMARY OF FINDINGSFACILITY DESCRIPTION AND OPERATIONS

tank. ~~water~~ This tank is located below building #7. The above mentioned tank along with 1) 5 x 3000 gal tanks on 2nd Floor of Bldg #7 2) 5 x 1,500 gal tanks on 2nd Floor of Bldg #7 3) 72 x 2,000 gal tanks on 3rd Floor of Bldg #7, were the subject of a March 19, 1987 Administrative Order to Frey Industries from NJDEP.

The buildings ~~was~~ numbered 2, 3, 9 and 7 and 12 which are located at 29 Riverside Ave. (Frey Industries) contain a variety of materials. Buildings 2 and 3 are used for raw material (liquid) storage in warehouse fashion (includes 55 gal and lower size containers). Building #9 is a general product storage (includes bags and fiber drums). Outside of building #9 150 tanks ^{with} of PNCB (poison) were in storage. Building #12 is being used for ^{type of general} storage with cardboard barrels and other types of containers ~~holding various materials~~.

The tanks mentioned previously were seen (except for underground tank) in building #7. ^{In} This building ~~also had~~ a repackaging of dyes/pigments were being done (Floor #2). Floor #3 was a miserable site as wet cardboard barrels with small lab-type bottles of chemicals were seen. There were also rusted steel drums with para formaldehyde opened to atmosphere (label read "dust has potential to cause explosion when mixed with air, avoid dust/vapor, keep container closed", ~~and~~ Product was from Kramer Chemical Inc Clifton NJ)

-A-

SUMMARY OF FINDINGSFACILITY DESCRIPTION AND OPERATIONS

Sections of floor 3 (bldg #7) were spotty with bluish marks and room had a phenol-like odor. An area with ^{bluish red} caked material was also seen on the floor of the same room. The 5 x 1500 gal tanks previously mentioned were seen with a varnish like material on the outside surface of the tank. This same material formed pillars between the tanks and the flooring of the room.

Within this room of building #7, floor 3, there were numerous drums stored in a haphazard fashion atop of each other. Some containers were leaning on each other, others were on their sides with material spilling from them unto the floor. Frey has already been issued a clean up orders for this building by NTDEP as mentioned earlier.

Outside of building #7, there is a dark stained ~~area~~ ^{unpaved} ~~just~~ at ~~at~~ the entrance to the building. This ^{unpaved} area is apparently contaminated with chemicals that drip from pipes/hoses used to ~~drum~~ ^{fill} drums on a drumming line located on the ground floor of building #7 about a ~~foot~~ away from stained spot. The company was advised by NTDEP personnel and have agreed to have soil samples from this area analysed for possible contamination. If contamination exist the company should remove appropriate section of soil and incorporate clean up in schedules for

SUMMARY OF FINDINGS

FACILITY DESCRIPTION AND OPERATIONS

closure of facility according to closure plan as per administrative order of March 19 from NJDEP. After removal of any contaminated soil and possible refilling with ^{the} company will be required to pave the area ^{with concrete or other appropriate material} to prevent future contamination.

Frey Industries was issued NOV for violation of NJAC 7:26-9.4(g) et seq, NJAC 7:26-9.6(f), NJAC 7:26-9. et seq. These violations and their expected compliance were discussed with facility personnel before proceeding to the special set of questions for code-6 facility below.

SUMMARY OF FINDINGS

Answers to special questions Re Code-6 facility,
Frey Industries.

FACILITY DESCRIPTION AND OPERATIONS

Frey Industries of 29 Riverside Ave, Newark has bought the assets of Tobar Packaging which was formerly located at 29 Riverside Ave Newark, NJ. Tobar Packaging had apparently filed ~~s~~ with the EPA as a TSDf. The owner of Frey Industries, Tillinghman B Frey has stated that he ^{does not know whether} ~~is unaware of~~ Tobar ~~s~~ had used tanks for storage of hazardous waste in fact he doesn't know whether Tobar packaging actually acted as TSDf.

In a letter to NJDEP (attached) date October 2, 1984 Tillinghman B Frey requested delisting of Frey Industries from TSDf to generator only. According to Mr Frey his company is definitely not a TSDf irrespective of what ~~is~~ Tobar packaging was, so he requested classification as generator only.

Apparently the company (Tobar packaging) or Frey Industries did not go through a formal closure. No closure plan was submitted to NJDEP by Frey Industries. Whether Tobar packaging had done this or not is unknown by Frey. Presently Frey Industries ~~is~~ has consultants and attorneys on payroll. These personnel are employed to determine whether Tobar packaging had used tanks for storage of hazardous waste, whether they did act as TSDf and ~~from~~ other information relating to

SUMMARY OF FINDINGS

FACILITY DESCRIPTION AND OPERATIONS

Frey Industries take over and subsequent responsibilities for Jobar's previous activities re hazardous waste management

On site ^{there are} numerous tanks ~~exist~~ as previously described in RCRA inspection section of this report. ^{previous use of these} These tanks ~~and~~ are being determined by consultants as mentioned previously. The company's president Tilghman B. Frey express concern at his company's status and outlined that Frey Industries is doing what is necessary to cooperate with NJDEP and have all matters concerning Hazardous waste management at Frey Industries resolved.

Describe the activities that result in the generation of hazardous waste.

Packaging of ~~ma~~ hazardous materials usually result in some spillage. The floor sweepings from rooms in which ~~hazardous~~ ~~materials~~ ~~substances~~ are packaged along with any other spill clean up of hazardous materials ~~as~~ constitutes Frey-Industries hazardous wastes.

Identify the hazardous waste located on site, and estimate the approximate quantities of each.
(Identify Waste Codes)

- Hazardous waste Solids ORME (Floor sweepings)
- company was not previously classifying this as hazardous waste but as of the date of inspection they have agreed to do so.
 - Quantity was therefore not ~~estimatatable~~ ^{estimatable}.

GENERATOR INSPECTION CHECKLIST

		YES	NO	N/A
7:26-8.5	<u>Hazardous waste determination</u>			
	(a) Did the generator test its waste to determine whether it is hazardous?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Is the waste hazardous?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7:26-8.5(b)2	Is the generator determining that its waste exhibits a hazardous waste characteristic(s) based on its knowledge of the material(s) or processes used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Has hazardous waste been shipped off site since November 19, 1980? <i>YES</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	If yes, how many shipments, off site, have been made and describe the approximate size of an average shipment made on a monthly basis. If facility is a small quantity generator, please explain. <i>1 shipment Dec 1</i> <i>via NTA 0016047</i>			
	<i>1 shipment X 852</i> <i>NTA 0030707</i>			
7:26-7.4(a)1	Does the generator have an EPA ID #?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7:26-7.4(a)4	Does each manifest have the following information? Please circle the elements missing and obtain a copy of the incomplete manifests. (List those manifests that are deficient)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7:26-7.4(a)4i	The generator's name, address and phone number?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7:26-7.4(a)4ii	The generator's EPA ID number?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7:26-7.4(a)4iii	The transporter(s) name, address and phone number?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7:26-7.4(a)4iv	The transporter(s) EPA ID number?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7:26-7.4(a)4v	The name, address and phone number of the designated TSD facility?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7:26-7.4(a)4vi	The TSDF's EPA ID number?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7:26-7.4(a)4vii	The name, type and quantity of hazardous waste being shipped, including such particulars as may be required regarding same?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

		YES	NO	N/A
7:26-7.4(a)4viii	Special handling instructions and any other information required on the form to be shipped by the generator?	✓	—	—
7:26-7.4(a)5	Before allowing the manifested waste to leave the generator's property, did the generator:			
7:26-7.4(a)5i	Sign the manifest certification by hand?	✓	—	—
7:26-7.4(a)5ii	Obtain the handwritten signature of the initial transporter and date of acceptance on the manifest?	✓	—	—
7:26-7.4(a)5iii	Retain one copy and forward one copy to the state of origin and one copy to the state of destination? <i>N/A 0230107 was not mailed to state (only photo copies of manifests kept here so it does not count)</i>	—	✓	—
7:26-7.4(a)5iv	Give remaining copies of the manifest form to the transporter? <i>if original copy was mailed to state Csc No Inc 910</i>	✓	—	—
7:26-7.4(f)1	Has the generator maintained facility records for three (3) years? (Manifest(s), exception report(s) and waste analysis)	✓	—	—
7:26-7.4(h)1	Has the generator received signed copies of portion B (from the TSD facility) of all manifests for waste shipped off site more than 35 days ago?	✓	—	—
7:26-7.4(h)2	If not:			
	1. Did the generator contact the hauler and/or the owner or operator of the TSDF and the NJDEP at 609-292-9877 to inform the NJDEP of the situation, and	—	—	+
	2. Have exception reports been submitted to the Department covering any of these shipments made more than 45 days ago?	—	—	↓
	Before transporting or offering hazardous waste for transportation off site, does the generator?			
7:26-7.2(a)	Conspicuously label appropriate manifest numbers on all hazardous waste containers that are intended for shipment?	—	—	✓
7:26-7.2(b)	Insure that all containers used to transport hazardous waste off site are in conformance with applicable DOT regulations (i.e., 49 CFR 171 - 49 CFR 179)?	✓	—	—

YES NO N/A

7:26-9.3

Accumulation time

How is waste accumulated on site?

- NTDEP & Companies
Consultant is
to determine
status of matl
within such
tanks.*
- ☒ Containers
 - ☐ Tanks (complete HWMF checklist)
 - ☒ Aboveground ☒ Below ground (*Concrete tank not in use*)
 - ☐ Surface impoundments (complete HWMF checklist *may contain product*)
 - ☐ Piles (complete HWMF checklist)

7:26-9.3(a)3

Is each container clearly dated with each period of accumulation so as to be visible for inspection? *None on site*

___ ___ ☒

7:26-9.3(a)1

Is waste accumulated for more than 90 days?

___ ___ ☒

If yes, complete HWMF checklist.

STOP HERE IF THE HAZARDOUS WASTE MANAGEMENT FACILITY (TSD) CHECKLIST IS FILLED OUT.

SHORT TERM ACCUMULATION STANDARDS (FOR GENERATORS WHO ACCUMULATE WASTE IN CONTAINERS FOR 90 DAYS OR LESS)

		<u>YES</u>	<u>NO</u>	<u>N/A</u>
7:26-9.4	<u>Containers</u> What type of containers are used for storage. Describe the size, type and quantity and nature of waste (e.g., 12 fifty five gallon drums of waste acetone). <i>55 gal drums may be used</i> <i>Inventory</i>			
7:26-9.4(d)1i	Do the containers appear to be in good condition, not in danger of leaking? If no, please describe the type, condition and number of leaking or corroded containers. Be detailed and specific.	—	—	✓
7:26-9.4(d)4i	Are all containers securely closed except those in use?	✓	—	—
7:26-9.4(d)4iii	Do containers appear to be properly handled or stored in a manner which will minimize the risk of the container rupturing or leaking?	✓	—	—
7:26-9.4(d)4iv	Are containerized hazardous waste segregated in storage by waste type? <i>NO waste on site.</i>	—	—	✓
7:26-9.4(d)4v	Is every container arranged so that its identification label is visible? <i>↓</i>	—	—	✓
7:26-9.4(d)5	Is the storage area inspected at least daily?	—	—	✓
7:26-9.4(d)6	Are containers holding ignitable and reactive wastes located at least 50 feet (15 meters) from the facility's property line?	—	—	✓
7:26-11.2	<u>Tanks</u> <i>company for decision</i> <i>(AD to decide if tanks on use of tank for waste storage or not)</i>			
7:26-12.1(a)	Does the generator store hazardous waste in tanks? If yes, what are the approximate number and size of tanks containing hazardous waste?	—	—	↓

Identify the waste treated/stored in each tank.

		<u>YES</u>	<u>NO</u>	<u>N/A</u>
	<u>General Operating Requirements</u>			
7:26-11.2(a)2	Are the tanks maintained so that there is no evidence of past, present, or risk of future leaks? If no, please explain.	---	---	+
	Are there leaking tanks?	---	---	+
7:26-11.2(a)2	Are all hazardous wastes or treatment reagents being placed in tanks compatible with the tank material so that there is no danger or ruptures, corrosion, leaks or other failures?	---	---	+
7:26-11.2(3)	Do uncovered tanks have at least 2 feet of freeboard or an adequate containment structure?	---	---	+
7:26-11.2(a)4	If waste is continuously fed into a tank, is the tank equipped with a means to stop the inflow from the tank, e.g., bypass system to a standby tank?	---	---	+
7:26-11.2(d)	<u>Inspections</u> (As above for tanks) Is the tank(s) inspected each operating day for: 1. Discharge control equipment 2. Monitoring equipment 3. Level of waste in tank 4. Construction of materials of the tank 5. Are the tanks and surrounding areas (e.g., dike) inspected weekly for leaks, corrosion or other failures?	---	---	↓
7:26-9.2(b)	Are there underground tanks used to store hazardous waste? If yes, how many and can they be entered for inspection?	---	---	---
7:26-11.2(e)	Are ignitable or reactive wastes stored in a manner which protects them from a source of ignition or reaction? If no, please explain.	---	---	---

		YES	NO	N/A
7:26-11.2(f)	Does it appear that incompatible wastes are being stored separate from each other?	—	✓	—
7:26-9.4(g)4	<u>Personnel training</u> Have facility personnel successfully completed a program of classroom instruction or on-the-job training since six months after the date of their employment or assignment to the facility or to a new position at the facility?	✓	—	—
7:26-9.4(g)2	Is the program directed by a person trained in hazardous waste management procedures and does it include instruction which teaches facility personnel hazardous waste management procedures (including contingency plan implementation) relevant to the positions in which they are employed?	✓	—	—
7:26-9.4(g)5	If yes, have facility personnel taken part in an annual review of the initial training? Is there written documentation of the following:	—	—	—
7:26-9.4(g)6i	Job title for each position at the facility related to hazardous waste management, and the name of the employee filling each job?	—	✓	—
7:26-9.4(g)6ii	A written job description for each position related to hazardous waste management?	—	✓	—
7:26-9.4(g)6iii	A written description of the type and amount of both introductory and continuing training that has been and will be given to personnel in jobs related to hazardous waste management?	—	✓	—
7:26-9.4(g)6iv	Documentation of actual training or experience received by personnel?	—	✓	—
7:26-9.4(g)7	Are training records kept on all current employees until closure of the facility and training records kept on former employees for three years from their last date of employment?	—	✓	—
7:26-9.4(g)8	Are semi-annual drills conducted involving all employees and appropriate local authorities to test emergency response capabilities at the facility in accordance with the contingency plan and emergency procedures development pursuant to NJAC 7:26-9.7?	—	✓	—

YES NO N/A

7:26-9.6

Preparedness and prevention

Does the facility comply with preparedness
and prevention requirements including
maintaining:

		YES	NO	N/A
7:26-9.6(b)1	An internal communications or alarm system?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7:26-9.6(b)2	A telephone or other device to summon emergency assistance from local authorities?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7:26-9.6(b)3	Portable fire equipment, spill control equipment, and decontamination equipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7:26-9.6(b)4	Water at adequate volume and pressure to supply water hose streams, or foam producing equipment, or automatic sprinklers, or water spray systems?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7:26-9.6(c)	Is equipment tested and maintained?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7:26-9.6(d)1	Is there immediate access to communications or alarm systems during handling of hazardous waste?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7:26-9.6(e)	Adequate aisle space to allow unobstructed movement of personnel fire protection equipment, spill control equipment and decontamination equipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	If no, please explain.			
	In your opinion, do the types of waste on site require all of the above procedures, or are some not required?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Explain.			
7:26-9.6(f)	Has the facility made the following arrangements, as appropriate for the type of waste handled on site:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7:26-9.6(f)1	Familiarize police, fire departments and emergency response teams with the layout of the facility and hazardous waste handled?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
7:26-9.6(f)2	Where more than one police and fire department might respond to an emergency, is there an agreement designating primary emergency authority to a specific police or fire department, and agreements with any others to provide support to the primary emergency authority?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

		<u>YES</u>	<u>NO</u>	<u>N/A</u>
7:26-9.6(f)3	Agreements with emergency response contractors, and equipment suppliers?	—	—	—
7:26-9.6(f)4	Arrangements to familiarize local hospitals with the properties of hazardous waste handled at the facility and the types of injuries or illnesses which could result from fires, explosions, or discharges at the facility?	—	—	—
7:26-9.6(f)5	Arrangements with local fire departments to inspect the facility on a regular basis with at least two (2) inspections annually?	—	—	—
7:26-9.7	<u>Contingency plan and emergency procedures</u>			
7:26-9.7(a)	Does the facility have a written contingency plan for emergency procedures designed to deal with fires, explosions, hazards to human health or environment, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil or surface water?	—	—	—
7:26-9.7(b)	Are provisions of the plan carried out immediately whenever there is a fire, explosion, or release of hazardous waste or hazardous waste constituents which could threaten human health or the environment?	—	—	—
7:26-9.7(c)	Does the contingency plan describe the actions facility personnel shall take in response to fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water at the facility?	—	—	—
7:26-9.7(d)	Did the owner or operator prepare a Spill Prevention, Control, and Countermeasures (SPCC) Plan in accordance with 40 CFR 112 or 151 or a Discharge Prevention, Containment and Countermeasure (DPCC) Plan in accordance with N.J.A.C. 7:1E-4.1 <u>et seq.</u> ?	—	—	—
	If yes, did the owner or operator amend that plan to incorporate hazardous waste management provisions that are sufficient to comply with the requirements of this section?	—	—	—
7:26-9.7(e)	Does the plan describe arrangements agreed to by local police departments, fire departments, hospitals, contractors, and State and local emergency response teams to coordinate emergency services?	—	—	—

		<u>YES</u>	<u>NO</u>	<u>N/A</u>
7:26-9.7(f)	Does the plan list names, addresses, and phone numbers (office and home) of all persons qualified to act as emergency coordinator and is this list kept up to date? Where more than one person is listed, one shall be named as primary emergency coordinator and others shall be listed in the order in which they will assume responsibility as alternates.	—	—	—
7:26-9.7(g)	Does the plan include a list of all emergency equipment at the facility (such as fire extinguishing systems, spill control equipment, communications and alarm systems (internal and external), and decontamination equipment), where this equipment is required? Is the list kept up-to-date? In addition, does the plan include the location and a physical description of each item on the list, and a brief outline of its capabilities?	—	—	—
7:26-9.7(h)	Does the plan include an evacuation procedure for facility personnel where there is a possibility that evacuation could be necessary? Does this plan describe signal(s) to be used to begin evacuation, evacuation routes, and alternative evacuation routes (in cases where the primary routes could be blocked by releases of hazardous waste or fires)?	—	—	—
7:26-9.7(i)	Is a copy of the contingency plan and all revisions to the plan: 1. Maintained at the facility; and 2. Has the contingency plan been submitted to local authorities (police fire departments, emergency response teams)?	—	—	—

REFERENCE NO. 11

REPORT ANY UNRECOVERED DISCHARGE
EQUAL TO OR IN EXCESS OF EACH HAZ-
ARDOUS WASTE ASSIGNED "RQ" VALUE TO
NATIONAL RESPONSE CENTER
800-424-8802


REPORTABLE QUANTITY VALUE
1 - 5000 LBS. 4 - 10 LBS.
2 - 1000 LBS. 5 - 1 L.B.
3 - 100 LBS.

CHEM TRN 800 424-9300
EPA HOTLINE 800 424-9346
CDC POISON CENTER 404 635-5313
DOT 202 426-1830

PLACARDS
PROVIDED

Please print or type (Form designed for use on elite (12 pitch) typewriter)

Form Approved OMB No. 2000-0404 Expires 7-31-86

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)		21 Generator's US EPA ID No NJD000729780	Manifest Document No 00001	22 Page 2	Information in the shaded areas is not required by Federal law				
23 Generator's Name FREY W. MEHWE (BASF) 24 RIVERSIDE DR. NEWARK, N.J. 07104 (201) 263-5437				L. State Manifest Document Number NJSA0230707					
24 Transporter Company Name Freehold - Cortage, Inc.				25 US EPA ID Number NJD054126164		N. State Transporter's ID NJAS-2265276			
26 Transporter Company Name				27 US EPA ID Number		O. Transporter's Phone (201) 462-2001			
						P. State Transporter's ID			
						Q. Transporter's Phone			
28 US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)				29 Containers No. Type	30 Total Quantity	31 Unit Wt. Vol	R. Waste No.		
a. Hazardous waste, liquid, NOS. ORM-E NA9189				008	DM	2720	P	X-850	
b. Hazardous waste solid, NOS. ORM-E NA9189				002	DF	00064	P	X-850	
c. Hazardous waste, solid, NOS. ORM-E NA9189				001	DM	00100	P	X-850	
d.									
e.									
f.									
g.									
h.									
i.									
S. Additional Descriptions for Materials Listed Above a) L, Bulk 80% water, 20% sludge b) S, Labblack c) S, Bulk 100% solid waste				T. Handling Codes for Wastes Listed Above X-850 - non RCRA Regulated materials X-850 NJ DEP waste NOS.					
32 Special Handling Instructions and Additional Information wear protective clothing, gloves, glasses, respirators when handling materials.									
TRANSPORTER	33 Transporter Acknowledgement of Receipt of Materials Printed/Typed Name Timothy M. McIntyre				Signature 				Date 01/21/87
	34 Transporter Acknowledgement of Receipt of Materials Printed/Typed Name				Signature				Date
FACILITY	35 Discrepancy Indication Space								

Please print or type (Form designed for use on elite (12 pitch) typewriter)

Form Approved OMB No. 2000-04-4 Expires 2-31-86

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)		21 Generator's US EPA ID No NJ D000729780	Manifest Document No 00001	22 Page 2	Information in this shaded area is not required by Federal law	
23 Generator's Name FREY WASTE HANDLING (BASE) 29 Riverside DR. NEWARK, N.J. 07104 (201) 263-5437		25 US EPA ID Number NJ D054126164		L. State Manifest Document Number NSA0230707		
24 Transporter Company Name FREY WASTE HANDLING, Inc.		27 US EPA ID Number		M. State Generator's ID SAME		
26 Transporter Company Name				N. State Transporter's ID NJ SAS-2265246		
				O. Transporter's Phone (201) 962-2601		
				P. State Transporter's ID		
				Q. Transporter's Phone		
GENERATOR	28 US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)		29 Containers No. Type	30 Total Quantity	31 Unit Vol. Yd.	R. Waste No.
	a Hazardous waste, liquid, wos. ORM-E NA 1189		008 DM 02720	P	X-850	
	b Hazardous waste solid, wos. ORM-E NA 9184		002 DF 00064	P	X-850	
	c Hazardous waste, solid, wos. ORM-E NA 9189		001 DM 00100	P	X-850	
	d					
	e					
	f					
	g					
	h					
	i					
S. Additional Descriptions for Materials Listed Above a) L, Bulk 80% water, 20% sludge b) S, LAB PACK c) S, Bulk 100% solid waste				T. Handling Codes for Wastes Listed Above X-850 - non RCRA Regulated materials T03 X-850 NJ DEP waste NOS.		
32 Special Handling Instructions and Additional Information wear protective clothing, gloves, glasses, respirators when handling materials.						
TRANSPORTER	33 Transporter Acknowledgement of Receipt of Materials			Date		
	Printed/Typed Name Timothy M. McIntyre			Signature <i>Timothy M. McIntyre</i>		
FACILITY	34 Transporter Acknowledgement of Receipt of Materials			Date		
	Printed/Typed Name			Signature		
35 Discrepancy Indication Space						



BILL OF LADING NO.

78989

CONSIGNOR: TROY WOODHOUSE

29 RIVERSIDE DR.

NEWARK, N.J. 07104

R. DORFNER (201) 263-5437

BILL TO: FES (F) Corp Inc, Chadd's Ford, Pa. 17317

Roller Environmental Services (U.T.) Inc.

Rt. 322 + 1295

Bridgeport, N.J. 08014

12 Bridgeport (609) 467-3100

SHIP AM NO.	H	COMMODITY DOT DESCRIPTION UN/NA# ACTUAL QTY. UM	BILLING REF.	MFST. LBS.	ORDERED QTY.	UNIT
L 10179	H	Waste flammable liquid, NOS flammable liquid	UN1493	2 DT 4 DM	1449 LB	
	H	Waste combustible liquid, NOS combustible liquid	NA 1493	1 DM	100 LB	
	H	Hazardous waste liquid, NOS ORM-E NA 9189		1 DF 8 DM	2,723 LB	
	H	Hazardous waste, Solid, NOS. NA 9189		2 DF 1 DM	164 LB	

Certification #1 - I certify that the above named materials are properly described and proper conditioning for transportation according to regulations of all governing

not
Certification #3 - If this shipment is to be delivered to the consignee without recourse
consignor, the consignor shall sign the following statement "The carrier shall not
delivery of this shipment without payment of freight and all other charges".Certification #2 - Received the above materials subject to
tariffs and/or contract in effect on date of issuance hereofDriver ☒ No ☐Certification #4 - Received the above described property in
good condition except as noted.

Consignee

Aspirator: Fitchell - Corby Inc

Date: 11/30/87

Placed in: 29 RIVERSIDE DR. Newark, N.J. 07104

Date: 11/30/87

REFERENCE NO. 12



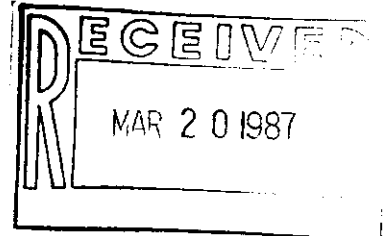
11/10
07-14-62

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF HAZARDOUS WASTE MANAGEMENT

John J. Trela, Ph.D., Acting Director
401 East State St.
CN 028

Trenton, N.J. 08625
609-633-1408

MAR 19 1987



IN THE MATTER OF	:	ADMINISTRATIVE ORDER
FREY INDUSTRIES	:	AND
TILINGMAN B. FREY, PRESIDENT:	:	NOTICE OF CIVIL ADMINISTRATIVE
29 RIVERSIDE AVENUE	:	PENALTY ASSESSMENT
NEWARK, NJ	:	

This Administrative Order and Notice of Civil Administrative Penalty Assessment is issued pursuant to the authority vested in the Commissioner of the New Jersey Department of Environmental Protection (hereinafter "NJDEP" or the "Department") by N.J.S.A. 13:1D-1 et seq. and the Solid Waste Management Act, N.J.S.A. 13:1E-1 et seq., and duly delegated to the Assistant Director for Enforcement of the Division of Hazardous Waste Management pursuant to N.J.S.A. 13:1B-4.

FINDINGS

- 1) The Department has determined that Frey Industries (hereinafter "Frey") is a hazardous waste facility (EPA ID #NJD000729728) as defined by N.J.A.C. 7:26-1.4, and is located at Block 614, Lot 1, 29 Riverside Avenue, City of Newark, County of Essex, State of New Jersey.
- 2) During the course of a routine Departmental records review, the following information regarding Frey was noted:
 - a. On October 1, 1984, the aforementioned facility was inspected by the Department. This inspection revealed the following tank storage facilities:
 1. Underground, concrete tank located under Building #7. This tank currently holds approximately 6 inches of liquid and sludge, which have a strong odor of chlorinated organic chemicals.
 2. Five 3,000 gallon tanks located on the second floor of Building #7. These tanks are currently empty and have been sand blasted clean.

3. Five 1,500 gallon tanks located on the second floor of Building #7. These tanks are currently empty, but are coated with a hard, varnish-like gum.
 4. Seventy-two 2,000 gallon tanks located on the third floor of Building #7. These tanks are currently empty, but contain hardened, resin-like residues.
- b. On October 2, 1984, the referenced facility wrote the Bureau of Hazardous Waste Engineering (hereinafter "BHWE") and requested to be delisted from TSD facility status to "generator only" status.
 - c. On October 19, 1984, the BHWE responded to the referenced facility's delisting request by asking for submission of a closure plan pursuant to N.J.A.C. 7:26-9.8 for the above mentioned tanks by November 19, 1984.
 - d. Pursuant to N.J.A.C. 7:26-9.8(c) and 9.8(e) Frey shall have a written closure plan and all revisions of said plan at the facility. Said plan shall be submitted to the Department pursuant to N.J.A.C. 7:26-9.8(h). At minimum the plan shall contain the following:
 1. A description of:
 - i. How and when the facility will be partially closed, if applicable, and ultimately closed;
 - ii. The maximum extent of the operation which will be unclosed during the life of the facility; and
 - iii. How the requirements of paragraph 9.8(b) and the applicable closure requirements this section, N.J.A.C. 7:26-10.1 et seq., or N.J.A.C. 7:26-11.1 et seq. (for existing facilities prior to final disposition of permit application) will be met;
 2. An estimate of the maximum inventory of wastes in storage or in treatment at any given time during the life of the facility;
 3. A description of the steps needed to decontaminate facility equipment during closure; and
 4. A schedule for final closure which shall include, as a minimum, the anticipated date when wastes will no longer be received, the date when completion of final closure is anticipated, and intervening milestone dates which will allow tracking of the progress of closure. (For example, the expected date for completing treatment or disposal of waste inventory shall be included, as well as the planned date for storage facilities and treatment processes.)

- e. On December 18, 1984, the BHWE received a closure plan for the hazardous waste storage tanks located at the referenced facility. The BHWE reviewed the closure plan and determined it to be deficient because it did not include:
1. A description of how and when the tanks would be closed;
 2. A description of the steps needed to decontaminate facility equipment during closure;
 3. A schedule for final closure which shall include the anticipated date when wastes will no longer be received, the date when completion of final closure is anticipated, and intervening milestone dates which allow tracking of the progress of closure; and
 4. A demonstration of compliance with N.J.A.C. 7:26-9.8(b) and 11.2(d).
- 3) Frey failed to include the above stated items, in violation of N.J.A.C. 7:26-9.8(c).
- 4) Since the aforementioned tanks were listed on the original Part A application, "the Department" presumes that any wastes, sludges, gums, and other residues remaining in these tanks are hazardous.
- 5) The BHWE issued the referenced facility a Notice of Deficiency on January 18, 1985, that requested submission of a revised closure plan that addressed items #1-4 above. In addition, the referenced facility was requested to prepare a soil sampling and analysis plan to determine the existence and/or extent of soil contamination from the tank facilities. The due date for this submittal was February 18, 1985.
- 6) Based on the facts set forth in these FINDINGS, the Department has determined that Frey has violated the Solid Waste Management Act, N.J.S.A. 13:1E-1 et seq. and the regulations promulgated pursuant thereto, N.J.A.C. 7:26-1 et seq., specifically N.J.A.C. 7:26-9.8(e)11, 9.8(e)3 and 9.8(e)4.

ORDER

NOW, THEREFORE, IT IS HEREBY ORDERED THAT FREY INDUSTRIES:

- 7) Within twenty one (21) calendar days submit an amended closure plan addressing closure of all the aforementioned tanks.
- a. The plan shall include a description of how and when the tanks would be closed.
 - b. The plan shall include a description of the steps needed to decontaminate facility equipment during closure.

- c. The plan shall include a schedule for final closure which shall include the anticipated date when wastes will no longer be received, the date when completion of final closure is anticipated, and intervening milestone dates which allow tracking of the progress of closure.

In addition, the closure plan must include a detailed soil sampling and analysis plan for the underground tank to determine the extent of contamination in the immediate areas where hazardous wastes were/are transferred, stored or treated. The soil samples should be taken as closely to the tank wall as possible. The minimum sample depth should not be less than the tank bottom. The soil sampling plan should include testing of virgin soil from an adjacent area to determine background contamination levels. All sample analysis must be performed by a state certified laboratory.

The sampling plan should include, at a minimum, procedures and techniques for:

1. Description of sample collection program. This should include information on the number of samples, location, depth, number of duplicates, etc.
 2. Chain of custody control to ensure sample preservation, shipment and processing.
 3. Complete analytical procedures with backup (instrument standardization) documentation.
 4. A complete list of parameters to be analyzed. This should include, at a minimum, all hazardous waste constituents identified under N.J.A.C. 7:26-8.16 that were/are transferred, stored or treated in the areas in question.
- 8) Submit all correspondence to the address below:
- New Jersey Department of Environmental Protection
Division of Hazardous Waste Management
Metro Field Office
2 Babcock Place
West Orange, NJ 07052
Attention: Arnold Schiff
- 9) Within twenty one (21) calendar days upon receipt of this Order submit the enclosed VERIFICATION OF COMPLIANCE by certified mail, return receipt requested or by hand delivery to:
- New Jersey Department of Environmental Protection
Division of Hazardous Waste Management
Bureau of Compliance and Technical Services
CN 028
Trenton, NJ 08625
Attention: Arnold Schiff

NOTICE OF CIVIL ADMINISTRATIVE PENALTY ASSESSMENT

- 10) Pursuant to N.J.S.A. 13:1E-9e and based upon the above FINDINGS, the Department has determined that a civil administrative penalty should be assessed against Frey in the amount of \$3,825.00.
- 11) Payment of the penalty is due when a final order is issued by the Commissioner subsequent to a hearing, if any, or when this Administrative Order and Notice of Civil Administrative Penalty Assessment becomes a final order (see following paragraph). Payment shall be made by certified check payable to "Treasurer, State of New Jersey" and shall be submitted to:

Assistant Director for Enforcement
Division of Hazardous Waste Management
CN 028
Trenton, NJ 08625

- 12) If no request for a hearing is received within twenty (20) calendar days from receipt of this Notice of Civil Administrative Penalty Assessment, it shall become a final order upon the twenty-first calendar day following its receipt and the penalty shall be due and payable.

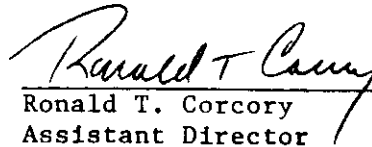
NOTICE OF RIGHT TO A HEARING

- 13) Pursuant to N.J.S.A. 52:14B-1 et seq. and N.J.S.A. 13:1E-9, Frey is entitled to an administrative hearing. Any hearing request shall be delivered to the address referenced in paragraph 9 within twenty (20) calendar days from receipt of this Administrative Order and Notice of Civil Administrative Penalty Assessment.
- 14) Pursuant to N.J.S.A. 52:14B-9(b) and N.J.A.C. 1:1-6.1(b), Frey shall, in its request for a hearing, furnish NJDEP with the following:
 - a. A statement of the legal authority and jurisdiction under which the hearing or action to be taken is to be held;
 - b. A reference to the particular sections of the statutes and rules involved;
 - c. A short and plain statement of the matters of fact and law asserted; and
 - d. The provisions of this Administrative Order and Notice of Civil Administrative Penalty Assessment to which Frey objects, the reasons for such objections, and any alternative provisions proposed.

GENERAL PROVISIONS

- 15) This Administrative Order and Notice of Civil Administrative Penalty Assessment is binding on Frey, its principals, directors, officers, agents, successors, assigns, any trustee in bankruptcy or other trustee, and any receiver appointed pursuant to a proceeding in law or equity.
- 16) Notice is given that violations of any statutes, rules or permits other than those herein cited may be cause for additional enforcement actions, either administrative or judicial. By issuing this Administrative Order and Notice of Civil Administrative Penalty Assessment the Department does not waive its right to initiate additional enforcement actions.
- 17) No obligations imposed by this Administrative Order and Notice of Civil Administrative Penalty Assessment (with the exception of paragraph 10, above) are intended to constitute a debt, damage claim, penalty or other civil action which should be limited or discharged in a bankruptcy proceeding. All obligations are imposed pursuant to the police powers of the State of New Jersey, intended to protect the public health, safety, welfare and environment.
- 18) Notice is given that pursuant to N.J.S.A. 13:1E-9e, the Department is authorized to assess a civil administrative penalty of not more than \$25,000.00 for each violation and additional penalties of not more than \$2,500.00 for each day during which the violation continues after receipt of an administrative order from the Department.
- 19) Notice is further given that pursuant to N.J.S.A. 13:1E-9f, any person who violates N.J.S.A. 13:1E-1 et seq. or any code, rule or regulation promulgated thereunder shall be liable to a penalty of not more than \$25,000.00 per day of such violation, and each day's continuance of the violation shall constitute a separate violation.
- 20) Notice is further given that pursuant to N.J.S.A. 13:1E-9f, any person who violates an administrative order issued pursuant to N.J.S.A. 13:1E-9c, or a court order issued pursuant to N.J.S.A. 13:1E-9d, or who fails to pay a civil administrative penalty in full after it is due shall be subject upon order of a court to a civil penalty not to exceed \$50,000.00 per day of such violation and each day's continuance of the violation shall constitute a separate violation.

- 21) Except as provided above in the Notice of a Right to a Hearing Section, this Administrative Order and Notice of Civil Administrative Penalty Assessment shall be effective upon receipt.



Ronald T. Corcory
Assistant Director
Enforcement - Division of
Hazardous Waste Management

RTC:AS:lmc

REFERENCE NO. 13

7-14-62
LAW OFFICES
COLE, GEANEY, YAMNER & BYRNE

A PROFESSIONAL CORPORATION

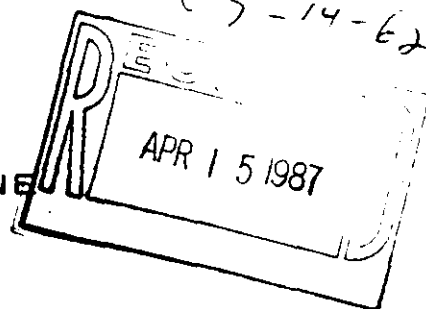
100 HAMILTON PLAZA

P.O. BOX D

PATERSON, N.J. 07509-0104

(201) 278-0500

TELECOPIER (201) 278-0784



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JERI S. BITTERMAN

April 9, 1987

Arnold Schiff
New Jersey Department of Environmental
Protection
Division of Hazardous Waste Management
Bureau of Compliance and Technical Services
CN 028
Trenton, NJ 08625

Re: In the Matter of Frey Industries,
Tilghman B. Frey, President
29 River Avenue
Newark, NJ

Dear Mr. Schiffman:

We serve upon you Notice of Hearing in the
above-captioned matter.

Very truly yours,


GARY S. REDISH

GSR:sc

Encl.

VIA CERTIFIED MAIL RRR and HAND DELIVERY

COLE, GEANEY, YAMNER & BYRNE, ESQS.
100 Hamilton Plaza
P.O. Box D
Paterson, NJ 07509
(201) 278-0500

ATTORNEYS FOR: Frey Industries, Inc.
and Tilghman B. Frey Petitioners

NOTICE OF HEARING REQUEST
PURSUANT TO N.J.S.A.
52:148-1 et seq. AND
N.J.S.A. 13:1E-9 FROM
ADMINISTRATIVE ORDER AND
NOTICE OF CIVIL ADMINISTRA-
TIVE PENALTY ASSESSMENT

IN THE MATTER OF FREY :
INDUSTRIES, TILGHMAN B. :
FREY, PRESIDENT :
29 Riverside Avenue :
Newark, NJ :
:
:
:

TO: ARNOLD SCHIFF
New Jersey Department of Environmental
Protection
Division of Hazardous Waste Management
Bureau of Compliance and Technical Services
CN 028
Trenton, NJ 08625

SIR:

PLEASE TAKE NOTICE, that the undersigned attorneys
for Frey Industries, Inc. and Tilghman B. Frey, Petitioners
hereby request a hearing pursuant to N.J.S.A. 52:14B-1
et seq. and N.J.S.A. 13:1E-1 from the Administrative Order

and Notice of Civil Administrative Penalty Assessment issued on March 19, 1987 for the reasons set forth below.

Petitioner relies upon N.J.S.A. 52:14B-9 (b) and N.J.A.C. 1:1-6.1 (b).

(a) Frey Industries, Inc. has never been engaged in the business commonly referred to as a "hazardous waste facility". Frey is engaged in the business of handling "virgin" chemicals many of which are "red label" materials and therefore "hazardous materials" as defined by various sections of the New Jersey Administrative Code.

Apparently, some years ago Jobar Industries obtained a United States Government Identification Number to conduct the business commonly known as a hazardous waste facility and was issued EPA I.D. #NJD000729728 by the United States Environmental Protection Agency. In or about 1980, Tilghman B. Frey became a principal of Jobar. He remained a principal of Jobar until October, 1982 at which time Jobar made an Assignment for the Benefit of Creditors pursuant to New Jersey law.

At no time between October, 1980 and October, 1982 was Jobar, to the best of Tilghman B. Frey's knowledge, engaged in the handling of hazardous waste. Tilghman B. Frey was on the site on a daily basis and never observed that company engaging in the handling of hazardous waste.

In January, 1983, Frey Industries, Inc. (a new company) bought the assets of Jobar in a judicial sale.

7:26-1.4 and that it has never operated a hazardous waste facility at block 614 - lot 1, 29 Riverside Ave., City of Newark, New Jersey. Further, the vats in question were abandoned on the site by PPG.

(c) See paragraph (a) above.

(d) Frey objects to the entire concept that it is responsible for presenting a closure plan and therefore objects to each and every finding of fact contained in the order as well as the requirements of DEP for furnishing a closure plan.

Frey Industries reserves the right to supplement this Notice of Hearing. This Notice of Hearing is being submitted to protect Frey Industries' rights pursuant to N.J.S.A. 52:14B-1 et seq., N.J.S.A. 13:1E-9, N.J.S.A. 52:14B-9(b) and N.J.A.C. 1:1--6.1(b).

COLE, GEANEY, YAMNER & BYRNE
Attorneys for Frey Industries
and Tilghman B. Frey,
Petitioners

BY 

GARY S. REDISH

Date: April 9, 1987

07-14-62



State of New Jersey
Department of Environmental Protection and Energy
Division of Responsible Party Site Remediation
CN 028
Trenton, NJ 08625-0028

OCT 2 9 30 AM '92

Scott A. Weiner
Commissioner

Karl J. Delaney
Director

M E M O R A N D U M

OCT 13 1992

TO: Peter T. Lynch, Chief
Facility Wide Enforcement - Metro

FROM: Robert Raisch, RCRA Facility Assessment Coordinator
Bureau of Field Operations - Site Assessment Section

SUBJECT: RCRA FACILITY ASSESSMENT (RFA) COMMITTEE REVIEW:
CROMPTON AND KNOWLES (NEWARK)
FREY INDUSTRIES (NEWARK)

Attached are the RFA narratives for the above RCRA sites. Because our investigation indicates past involvement by your program with these sites, I request that you review these drafts reports and forward any recommendations and/or comments to our office by October 11, 1992. After review, if you find the RFA conclusions/recommendations acceptable, please sign where indicated on the last page.

Should you have any questions, please feel free to contact me at (609) 584-4282.

The Site Assessment Section is located at the Horizon Center, CN 407. Thank you for your anticipated cooperation in this matter.

RR:mz
Attachments

Called Rob 11/12/92
in, say "OK" He said
Site Remediation will handle
Frey Industries since entire transferred case to Site Remediation.
AK
→

AHL000141

FREY INDUSTRIES INC.
AKA: JOBAR PACKAGING INC.
29 RIVERSIDE AVENUE
NEWARK, ESSEX COUNTY, NEW JERSEY
EPA ID NO. NJD000729780

OCT 2 9 30 AM '92

I. FACILITY DESCRIPTION/BACKGROUND INFORMATION

OWNERSHIP HISTORY

Frey Industries, Inc. leases and occupies approximately 3.5 acres of a larger industrial property east of River Road in the Newark, Essex County. The portion of the property which Frey Industries, Inc. occupies consists of Block 614; Lots D, E, F, G, and part of Lot 1 as identified on a proposed subdivision map dated 1985 in the Essex County Register's Office. These lots correspond to the 1987 Newark Tax Map as Block 614; Lots 1, 61, 62, 63, 64. Jobar Packaging, Inc. operated at the portion of the property presently occupied by Frey Industries from 1979 until 1982. On August 10, 1983 Frey Industries informed the New Jersey Department of Environmental Protection (NJDEP) that it had purchased the assets of Jobar Packaging.

The Industrial Development Corporation is the current owner of the property. The property was purchased by the Industrial Development Corporation from the City of Newark in bankruptcy court in 1979. Pittsburgh Plate Glass (PPG) owned the property from prior to 1931, until it abandoned the property and all buildings on it in 1974. The City of Newark foreclosed on the property in 1977.

Deed records on file at the Essex County Register's Office indicate that the Patton Paint Company owned a portion of the site in 1871. A deed dated March 21, 1871 grants riparian rights to Patton Paint to allow the owner to fill and change exterior lines of the shore of the property. Sanborn Fire Insurance maps, dated 1892 and 1909, show that most of the current site property consist of filled and bulkheaded land between River Road and the Passaic River. The 1909 Sanborn Fire Insurance map also reveals five buildings occupied by the Patton Paint Company on the property at that time. A portion of the property at that time was also occupied by the Trinton Boat Club which was purchased in 1902 by the Patton Paint Company.

On November 3, 1920 the Patton Paint Company was merged with the Pittsburgh Plate Glass Company (PPG). PPG acquired the property owned by Patton Paint in a deed dated December 31, 1920. Other land acquired by PPG as its facility was expanded included a parcel from Joseph Margules on February 9, 1923; a 4.38-acre parcel from Rowena E. Gibbs on February 28, 1924; a parcel from the Erie Land Improvement Company on May 21, 1925; and an approximately 1.22-acre parcel from the City of Newark

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on April 10, 1941. Two small parcels, totaling approximately 1.0 acre, were sold by PPG in 1956 to the State of New Jersey for construction of Route 21. It does not appear that any further real-estate transactions regarding the property took place until the City of Newark acquired the property in bankruptcy court in 1977.

OPERATIONS

Frey Industries, Inc. warehouses, packages, repackages and distributes industrial chemicals for customers including Ashland Chemical, BASF, Mobay Chemicals and Monsanto. Although these chemicals are stored, packaged and distributed by Frey Industries, the chemicals remain the customer's property and are shipped and sold under the customer's names.

Products handled by Frey Industries include polyester resins, flammable liquids, corrosives and poisons. An inspection conducted by the NJDEP, Division of Hazardous Waste Management (DHW) Bureau of Field Operations, Metro Office (BFO-M) on April 2, 1987 revealed the following hazardous materials at the facility: o-nitrochlorobenzene, dimethylaminopolyamine, acetyl chloride, diethyl sulfate and cresylic acid. See Attachment (D) for a complete inventory of chemicals distributed by Frey Industries.

Materials are received and shipped from the facility in 55-gallon drums and by tank truck, tank rail car and in isotanks (tanks that are transported by container ships). Hazardous wastes are generated by the cleaning of transfer lines and from floor sweepings consisting of absorbent material used to clean up small quantity spills that occur during packaging and transfer operations.

Frey Industries occupies Buildings # 2, 3, 7, 19, 12 and 15 in the multi-tenant industrial complex owned by the Industrial Development Corporation. Building # 2 is used for office space and drum storage. Drums are also stored in Buildings # 3, 6, 9, 12 and, until 1991, in the lower portion of Building #7. Material transfer from bulk storage to individual drums occurred from the time Jobar Packaging operated at the facility until 1991 in Building #7 and at the railroad spur adjacent to Building #12. Documentation indicates that the operations conducted at the facility by Jobar Packaging were essentially the same as those currently conducted by Frey Industries.

PPG manufactured paint and varnish at the site from 1920 to until 1972. Specific information regarding operations conducted by PPG is not available. However, one concrete 100,000-gallon underground storage tank, located under

AH000143

Building #7; five 3,000-gallon, five 1,500-gallon and seventy-two 2,000-gallon aboveground tanks located within Building #7 were constructed at the facility by PPG.

Additionally, the Sanborn Fire Insurance map dated 1931 indicates that the following buildings and structures were built and were being used by PPG: a total of fifteen buildings, two aboveground storage tanks (AGSTs) used to store naphtha, eight AGSTs used to store oil, ten underground storage tanks (USTs) used to store oil and several structures that appear to be grain silos. Buildings #1 and 2 were used for warehousing and shipping. Buildings #3, 4 and 5 functioned as the factory buildings. Building #12 was used for warehousing. Barrels of an unspecified material were stored in Building #8. Building #7 contained varnish ovens and is identified as another factory building. The first floor of Building #9 was used for manufacturing and the second floor was used as office space. Building #10 was the linseed oil plant and had a 25,000-gallon water tower on top of it. Building #15 is identified as the tank building while Buildings #13 and 14 were used for lacquer manufacturing. Sanborn Fire Insurance maps from 1951 and the 1970s, and a review of aerial photographs indicate that no major changes occurred at the PPG property from the 1930s until the late 1970s. Buildings #3, 4 and 5 of the original PPG facility were demolished in 1982 after they were damaged by a fire.

Records indicate that the Patton Paint Company also manufactured paint and varnishes at the site. The 1909 Sanborn Fire Insurance map reveals five buildings, two 50,000-gallon AGSTs, and four 9,500-gallon AGSTs, all holding either turpentine or linseed oil. The same map also shows a hotel bath house and boat building shop existing at the northern portion of what later became the PPG site.

DEMOGRAPHICS

Several other industrial operations are located within the same complex in which Frey Industries is located, including Ardmore Chemical, Cosmetica, Federal Refining, Gloss Tex, Roloc Inc. and Chemical Compounds. The property is located in a mixed residential and commercial/heavy industrial area of Newark. On the north side of the property is a fuel oil distributor and south of the property is a concrete manufacturing company. The property is bordered on the east by the Passaic River and on the west by McCarter Highway. The closest residential area is approximately 0.15 mile west of the site. Populations within a 1.0-mile and 4.0 mile radius of the site are 62,000 and 475,000, respectively.

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HYDROGEOLOGY

Historical maps indicate much of the former PPG site, including a portion of the site now occupied by Frey Industries, was built on land that was filled along the bank of the Passaic River prior to 1909. Soils in the site area are derived from glacial deposits which are described as unsorted sediments consisting of clays, silts, sand, gravel, cobbles and boulders. Underlying the glacial deposits, at a depth of approximately 100 feet, is the Brunswick Formation consisting of soft red shales with interbedded, harder sandstones and minor amounts of conglomerate.

The Brunswick Formation serves as the aquifer of concern in the Newark area and is hydraulically connected with the overlying glacial deposits. The water table in the site area is between 5 and 10 feet below the ground surface. The depth to the primary aquifer in the Brunswick Formation is approximately 95 to 135 feet below the surface.

There are no designated sole source aquifers within a 4.0-mile radius of the site. Groundwater in the vicinity of the site is used for industrial purposes. There are no domestic potable wells or public supply wells within a 4.0 mile radius of the site.

SURFACE WATER

The facility is situated on a generally flat area adjacent to the Passaic River with drainage to the east into the river. Designated uses of the Passaic River are secondary contact recreation and migration of fish and wildlife populations. An unnamed tidal wetlands area covering approximately 37 acres is located approximately 1.5 miles east and downstream of the site. The Passaic River flows into Newark Bay approximately 3.0 miles east of the site. There are no surface water intakes on the Passaic River downstream of the site. The Passaic River is tidal at the location of the site.

The property that Frey Industries occupies is located within a 100 year flood zone of the Passaic River where the base flood elevation is 10 feet above mean sea level.

ENFORCEMENT STATUS

Jobar Packaging and Frey Industries have received several violations, orders and penalty assessments from the NJDEP, mostly involving both companies' failure to submit required RCRA and Air Pollution Control permit information. Frey Industries received two Administrative Orders from the NJDEP, Division of Environmental Quality (DEQ) for small spills — causing air releases which resulted in several complaints. The enforcement history of the Jobar Packaging/Frey Industries facility is outlined below:

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1. An order was issued by the NJDEP, DEQ to Jobar Packaging on July 1, 1981 to cease operating equipment requiring an air pollution permit.
2. An order was issued by the NJDEP, DEQ to Jobar Packaging on May 10, 1982 to cease open burning refuse.
3. A Notice of Prosecution was issued by the NJDEP, DEQ to Jobar Packaging on June 16, 1982 for the installation and operation of equipment without a pollution control permit.
4. A Notice of Violation (NOV) was issued by the NJDEP, Division of Hazardous Waste Management (DHWM) Bureau of Compliance and Enforcement to Jobar Packaging on November 15, 1982 for the company's failure to submit a TSD Annual Report.
5. An NOV was issued by the NJDEP, DHWM, Bureau of Compliance and Enforcement to Frey Industries on October 18, 1983 for failure to submit a TSD Annual Report.
6. An NOV was issued by the NJDEP, DHWM, Bureau of Compliance and Enforcement to Frey Industries on October 20, 1983 for failure to submit a RCRA Annual Generator Report.
7. An Administrative Order was issued by the NJDEP, DHWM to Frey Industries on November 16, 1983 to submit a revised Part A application, establish financial assurance and demonstrate financial responsibility for claims against the company.
8. An NOV and Penalty Assessment offer were issued by the NJDEP, DHWM to Frey Industries on July 10, 1984 for failure to submit a Facility Annual Report for 1983.
9. An Administrative Order and Notice of Civil Administrative Penalty Assessment was issued by the NJDEP, DEQ on August 8, 1986 for allowing acetylchloride odors to be emitted to the atmosphere during drum cleaning operations resulting in several complaints from workers of nearby business.
10. An Administrative Order and Notice of Civil Administrative Penalty Assessment was issued by the NJDEP, DHWM on March 19, 1987 for Frey Industries to submit: a written closure plan including a detailed soil analysis sampling plan, an estimate of maximum inventory of waste storage at the facility, description of decontamination steps during closure and schedule for final closure.

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11. An Administrative Order and Notice of Civil Administrative Penalty Assessment was issued by the NJDEP, DEQ to Frey Industries on July 15, 1988 for the release of an air contaminant, p-nitrochlorobenzene, as a result of leakage from a rail tank car.
12. An Administrative Order and Notice of Civil Administrative penalty Assessment was issued by the NJDEP, DEQ to Frey Industries on November 29, 1990 for a p-nitrochlorobenzene spill resulting in several complaints of illness reported by workers in the adjacent area.

II. PERMITS

Jobar Packaging, Inc. filed a notification of hazardous waste activity on August 14, 1980; the site was listed as a Treatment, Storage, or Disposal facility (TSD). On November 19, 1980 Jobar Packaging filed a Part A application with the USEPA. The Part A application was received by the NJDEP on November 19, 1980 and acknowledged by NJDEP on January 15, 1981. The Jobar Packaging Part A application listed annual hazardous waste storage in tanks at 201,767,000 gallons per year.

On November 24, 1982 Frey Industries, Inc. notified the NJDEP that Jobar Packaging, Inc. had been liquidated on October 31, 1982 and that Frey Industries, Inc. was in the process of purchasing the assets of Jobar Packaging, Inc. Frey Industries notified NJDEP on August 10, 1983 that it had purchased the assets of Jobar Packaging on January 21, 1983 and that their business would be essentially the same as Jobar Packaging's. On August 7, 1983 the NJDEP requested that Frey Industries submit a revised Part A application, proof of establishment of financial assurance for closure and demonstration of financial responsibility for claims arising from the operation of the facility. On October 2, 1984 Frey Industries requested from the NJDEP, Bureau of Hazardous Waste Engineering (BHWE) to be delisted from a TSD Facility to generator only status. The NJDEP, BHWE responded to Frey Industries request to delist as a TSD by asking for a submission of a closure plan for all the storage tanks at the facility. On December 18, 1984 the NJDEP, BHWE received a closure plan for the hazardous waste storage tanks at the facility; however, BHWE review of the closure plan had found it to be deficient.

Frey Industries contends that it never engaged in the handling of hazardous waste and objected to being forced to create and effectuate a closure plan for equipment that was left on site when PPG abandoned the premises. The company's position was that PPG should be responsible for the closure plan. A Notice of Hearing Request was submitted by Frey Industries to the

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NJDEP, DHWM, Bureau of Compliance and Technical Services on April 9, 1987 in response to an Administrative Order and Notice of Civil Administrative Penalty Assessment issued by NJDEP on March 19, 1987 for Frey Industries' failure to provide a revised closure plan and for failure to provide a soil sampling and analysis plan as requested. A written outcome of the hearing was not found in the documentation; however, Frey Industries continued to provide closure plan information to the NJDEP, Bureau of Hazardous Waste Engineering in partial compliance with the March 19, 1987 Administrative Order.

Correspondence between Frey Industries and NJDEP on file at the NJDEP, BHWE, indicates that Frey Industries continued to argue that it should not be responsible for closure of the units at the site through 1990. Frey Industries' primary complaint is that Jobar Packaging filed the RCRA Part A application with USEPA in 1980 and that Frey Industries should not be considered a successor corporation to Jobar Packaging because it did not assume any debt or liabilities of Jobar Packaging pursuant to the purchase of Jobar's assets. Frey Industries leases space in buildings occupied by Jobar Packaging, but does not own either the buildings or the storage tanks within Building #7. Furthermore, Frey Industries, president, Tilghman Frey, has stated that neither Jobar Packaging nor Frey Industries used any of the units on the site for the storage of hazardous wastes. It should be noted that the file search revealed documentation stating that Tilghman Frey was president of Jobar Packaging at the time Frey Industries purchased the assets of Jobar Packaging and that floor and tank fill line washings were stored/disposed of in the 100,000-gallon UST by both Jobar Packaging and Frey Industries. These fill line washings were 99% water and considered by NJDEP to be non-hazardous.

On August 3, 1990, the NJDEP, DHWM, BHWE completed a review of a closure plan submitted by Environmental Waste Management Associates (EWMA), Frey Industries' environmental consultant, on May 31, 1990. The NJDEP, BHWE's review stated that the following items must be addressed in the closure plan:

1. The 82 aboveground storage tanks in Building #7 which were characterized as hazardous waste storage tanks in the Part A application filed with USEPA by Jobar Packaging, Inc. on November 19, 1980, must undergo closure prior to the facility delisting.
2. Frey Industries must address the closure of the underground storage tank under Building #7 which reportedly contained washwater and sludge as well as two other abandoned aboveground storage tanks.

During a RCRA Visual site Inspection (VSI) conducted by the Division of Responsible Party Site Remediation, Bureau of Field Operations, Site Assessment Section on June 10, 1992, Mr. Frey stated he did not know that Barry Kessler, the former owner and president of Jobar Packaging, filed the Part A application until he was informed by the NJDEP, BHWE in 1983 that the tanks had to be closed. The issue of whether Frey Industries should be responsible for the closure of the storage tanks is still unresolved.

SPILL HISTORY

There have only been three documented spills at the Jobar Packaging/Frey Industries facility. On July 20, 1977 a valve in a tank truck leaked approximately 25 pounds of perchloroethylene into the ground at Baron-Bakeslee, Inc., of Melrose Park, Illinois who is a subtenant of Frey Industries. The truck was emptied and the soil contaminated as a result of the leak as removed by representatives of Baron-Bakeslee. Other reported spills involved air emissions, acetylchloride from drum cleaning operations on June 28, 1986, and p-nitrochlorobenzene from an open pipe valve on June 6, 1990. None of these releases resulted in contamination of soils of the site. Although there have been no other documented spills at the Frey Industries facility, the property at which the facility is located has been used for industrial purposes for approximately 100 years; therefore, it is likely other spills have occurred. Soil sampling results submitted by Environmental, Waste Management Associates, (EWMA) Frey Industries' environmental consultant, as part of a sampling/closure plan submitted to the NJDEP, DHWM, BHWE in May 1990, revealed soil contamination by metals and petroleum hydrocarbons which are potentially the result of PPG activities at the site since these contaminants are associated with the paint industry and are not materials generally handled by Frey Industries.

III. SOLID WASTE MANAGEMENT UNITS

Based on Jobar Packaging's RCRA Part A application, 82 above ground storage tanks and a 100,000-gallon underground storage tank were used to store hazardous waste. As discussed previously in the Permits section of this report. Frey Industries contends that the Part A application submitted by Jobar Packaging was inaccurate and that hazardous waste was not stored in these tanks by either Frey Industries or Jobar Packaging. During an inspection conducted by the NJDEP, DHWM, on October 1, 1984 it was noted that aboveground storage tanks within Building #7 contained hardened, resin/varnish like material, possibly remaining from when PPG operated at the site. The underground storage tank was being used to collect filling line washings generated from the flushing of pipes used to transfer material from bulk storage to 55-gallon drums. Approximately 6 inches of liquid and sludge having a

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strong chlorinated organic chemical odor was noted in the UST at the time of the inspection. Based on the information found in the documentation, the 100,000 gallon UST is the only Solid Waste Management Unit identified at the Frey Industries facility. All other tanks at the facility appear to have been used for raw material storage and production purposes by PPG and are not regulated by RCRA.

Solid Waste Management Unit

1. The 100,000-Gallon Underground Storage Tank is constructed of concrete and located under Building #7. In some of the documents reviewed, it was indicated that there are two tanks referred to as 100,000-gallon sumps. During the VSI conducted on June 10, 1992, Mr. Frey stated that there was one underground tank and that it was part of the basement of Building #7. The age of the tank and details of its construction and condition are not available; however, it is reported that the tank does not have a bottom and it was constructed at the time the building was built approximately 1920. Frey Industries contends that the tank was not used by either Frey Industries or Jobar Packaging. As discussed previously, it is reported that the tank was used to store/disposed of wash water from line cleaning operations by Jobar Packaging and also by Frey Industries. The filling line washwater is considered by the NJDEP to be non-hazardous because it is 99% water. It is not known what PPG stored in the tank. During an inspection conducted by the NJDEP, DHWM on October 1, 1984 it was noted that the tank contained approximately 6 inches of liquid and sludge that had a strong odor of chlorinated organic chemicals.

The Passaic Valley Sewerage Commission (PVSC) refused to allow Frey Industries to pump the contents of the tank into the municipal sewer line in 1987 because excessive amounts of flammable materials were detected in the tank. The primary material in the tank was petroleum hydrocarbons (46,000 ppm TPHC). The PHCs are believed by Frey Industries and the PVSC to be flowing into the tank from the surrounding groundwater during periods of heavy rain. In addition to the PHCs, other contaminants detected in samples collected from the tank by Advanced Environmental Technology Corporation and analyzed by Townley Research Consulting of Plainfield, New Jersey on April 28, 1987 included trans-1,2-dichloroethene (17 ppm) and chloroform (10 ppm).

Due to the unknown nature of the use of the 100,000-gallon underground storage tank by PPG and the reported use of the tank for storage/disposal of wash water used generated during transfer line cleaning, a RCRA Facility Investigation (RFI) is recommended. The RFI should include but not be limited to sampling the sludge in the tank and collecting core samples of

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soil beneath the tank if it does not have a bottom, in order to determine the historical use, as well as the installation and sampling of monitoring wells.

At the time of this report, Frey Industries still contends that it should not be responsible for the closure of the tanks on the site and is waiting for a decision regarding this issue from the NJDEP, BHWE.

IV. GENERAL FACILITY FINDINGS

AREAS OF ENVIRONMENTAL CONCERN:

Eleven areas of environmental concern (AECs) were identified in a Sampling/Closure Plan, dated May, 1990, that was submitted to the NJDEP, DHWM, Bureau of Hazardous Waste Engineering by Environmental Waste Management Associates (EWMA), Frey Industries' environmental consultant. It should be noted that these AECs, which include the 100,000-gallon UST and the 82 AGSTs previously discussed, are located only within the portion of the PPG site that is now occupied by Frey Industries. Several of the AECs were initially identified and were sampled by International Technology Corporation (IT) for Frey Industries in 1986. Based on the results obtained by IT and inspections conducted by EWMA the following AECs were identified:

- 1) Interiors - Buildings # 7, 9, 12 and 15
- 2) Railroad Spur adjacent to Building #12
- 3) Building #12 Loading Dock
- 4) Outside Drum Storage Area - Building #12
- 5) Outside Drum Storage Area - Southwest of Building #7
- 6) Outside Drum Storage Area - Southeast of Building #7
- 7) Outside Drum Storage Area - Building #20
- 8) Drum Storage Area Adjacent to Railroad Spur
- 9) Above ground Storage Tanks
- 10) Concrete Underground Storage Tank - below Building #7
- 11) Area between Buildings #3 and #12

Interiors of Buildings #6, 7, 9, 12 and 15

Drums containing hazardous chemicals and materials used in the chemical and pharmaceutical industries are temporarily stored in Buildings # 6, 9, 12 and 15 and formerly stored in Building #7. Areas of concern found within these buildings consisted of pipes suspected of containing asbestos thermal insulation, areas of the floor that are stained where spillage had occurred and drum storage areas. The buildings do not have floor drains and none of these non-RCRA regulated areas of concern are believed to have resulted in releases to the environment. During the VSI conducted on June 10, 1992 the first floor of Building #7 was noted to be vacant. Mr. Frey stated that Frey Industries stopped using Building #7 in 1991. Varnish residues were noted on a number of AGSTs on the second

AHLC00151

and third floors of Building #7. It did not appear that the tanks had been used since PPG abandoned the site in the early 1970s.

Railroad Spur Adjacent to Building #12

The railroad spur adjacent to Building #12 is used as a transfer area for bulk material in rail cars to individual drums or tank trucks. Soil samples collected from this area by IT were analyzed for priority pollutants plus forty peaks (PP+40) and petroleum hydrocarbons (PHC). Lead (680 ppm) and PHCs (11,000 ppm) were detected above NJDEPE proposed cleanup standards of 600 ppm for lead and 1,000 ppm for PHCs for non residential sites.

Building #12 Loading Dock

The Building #12 Loading Dock is associated with material transfer operations that occur along the railroad spur. A soil sample collected from this area revealed lead (1,400 ppm) and PHCs above NJDEPE proposed cleanup standards.

Outside Drum Storage Area - Building #12

Empty drums are stored in the Outside Drum Storage Area adjacent to Building #12. The area is partially paved and the drums are covered with plastic. Lead (800 ppm) was detected above the NJDEPE proposed cleanup standard. Base neutral organic compounds were detected totaling 31 ppm.

Outside Drum Storage Area - Southwest of Building #7

The Outside Drum Storage Area southwest of Building #7 is used to store empty drums. A surface soil sample revealed concentrations of lead (1,000 ppm).

Outside Drum Storage Area - Southeast of Building #7

Empty drum storage occurs in the Outside Drum Storage Area, southeast of Building #7. Lead (3,100 ppm) was revealed at concentrations above the NJDEPE proposed cleanup standard in one of four surface soil samples collected; cadmium (110 ppm) was detected above the NJDEPE proposed cleanup standard of 100 ppm in one sample.

Outside Drum Storage Area - Building #20

Empty drums are stored outside Building #20. Ethylbenzene (4.3 ppm) and lead (450 ppm) were detected below the NJDEPE proposed cleanup standards in this area.

Drum Storage Area Adjacent to Railroad Spur

Frey Industries stores empty drums in the area adjacent to the railroad spur. Soil samples collected in this area revealed lead contamination at concentrations up to 660 ppm. Base neutral organic compounds were detected at a total concentration of 54 ppm.

AHL000152

Above Ground Storage Tanks

Two abandoned AGSTs are located within a concrete dike. Documentation indicates these tanks were used to store fuel oil. Petroleum hydrocarbon concentrations below NJDEPE proposed cleanup standards were revealed in samples collected in this area. The rest of the AGSTs are located inside Building #7 and appear to have been used for the manufacture of paint and varnish by PPG. The tanks have visual deposits of varnish and paint residues; however, due to their indoor location have not likely been the source of a release to the environment.

V. FINAL RECOMMENDATIONS/CONCLUSIONS

- A. Identify all Solid Waste Management Units (SWMUs) which require further investigation before a "No Release" determination can be assessed:

1. 100,000-gallon Under Ground Storage Tank

- B. Identify all areas of environmental concern requiring further investigation:

The following areas have been shown to have soil contamination above proposed NJDEPE cleanup standards for non-residential sites.

1. Railroad Spur Adjacent to Building #12 (lead, PHCs)
2. Building #2 Loading Dock (lead)
3. Outside Drum Storage Area - Building #12 (lead)
4. Outside Drum Storage Areas - Building #7 (lead)
5. Drum Storage Area Adjacent to Railroad Spur (lead)

Submitted by:

Robert Raisch, HSMS II
NJDEPE, Bureau of Field Operations
June 15, 1992

AHL000153

CONCLUSIONS AND RECOMMENDATIONS

I. CONCLUSIONS

1. IDENTIFY ALL SWMU'S WHICH HAVE A "NO RELEASE" DETERMINATION AND DO NOT REQUIRE AN RFI.

None

2. IDENTIFY ALL SWMU'S WHICH HAVE HAD DOCUMENTED RELEASES TO THE ENVIRONMENT AND REQUIRE AN RFI.

None

3. IDENTIFY ALL SWMU'S WHICH REQUIRE FURTHER INVESTIGATION FOR A "NO RELEASE" DETERMINATION.

100,000 Gallon Underground Storage Tank

4. IDENTIFY AREAS OF ENVIRONMENTAL CONCERN REQUIRING FURTHER INVESTIGATION.

1. Railroad Spur adjacent to Building #2
2. Building #2 Loading Dock
3. Outside Drum Storage Area Building #12
4. Outside Drum Storage Area Building #7
5. Drum Storage Area adjacent to Railroad spur

THE ABOVE CONCLUSIONS AND RECOMMENDATIONS ARE ACCEPTED FOR PURPOSE OF THE COMPLETION OF RCRA FACILITY ASSESSMENT REQUIREMENTS.

SIGNED:

DATE

Robert R. Rauh Jr.
Preparer

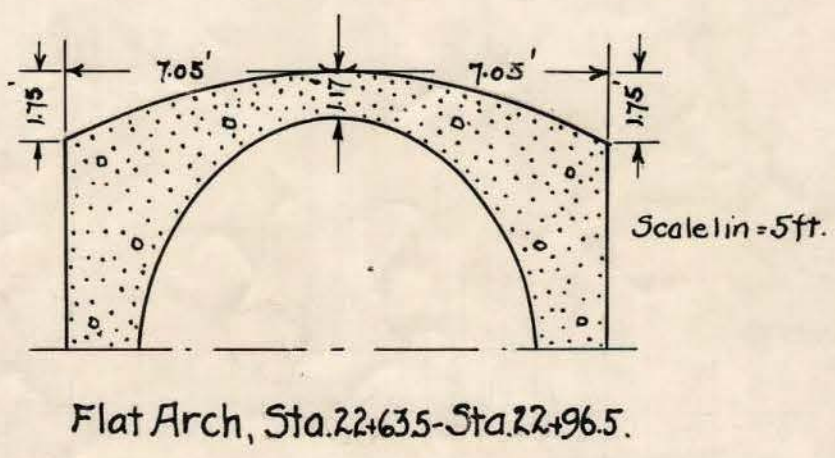
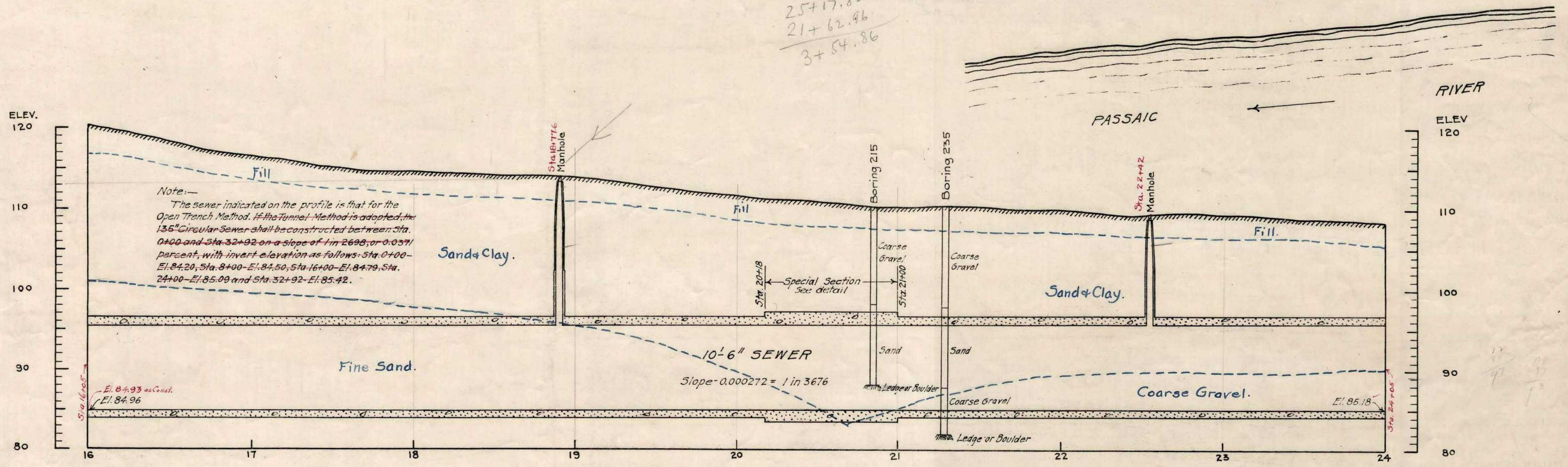
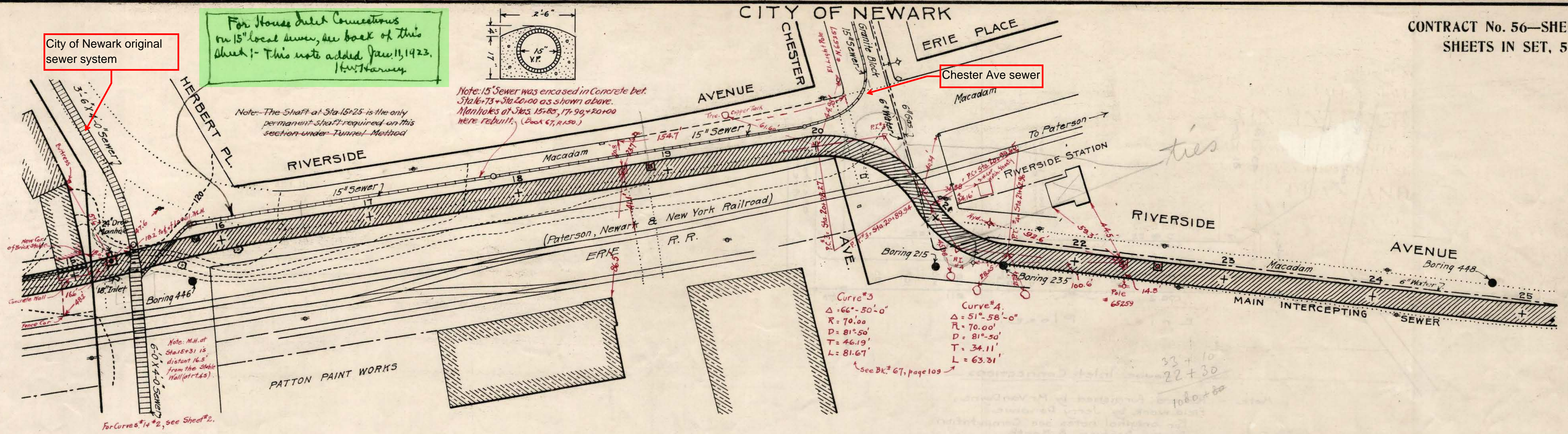
June 15, 1992

DER/BHWE

DFWE-BFO-M

AHL000154

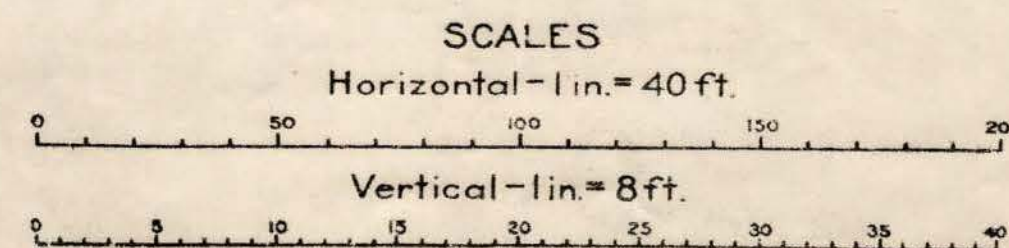
APPENDIX B: PVSC AND NEWARK SEWER INFORMATION



NOTE:—The borings and indications of pipes and other underground structures are supposed to be approximately correct, but should they be found to be otherwise the Contractor shall have no claim on that account, it being expressly understood that the Commissioners do not warrant the plot to be approximately correct.

The precise character of the foundation and the section at any given point cannot be determined in advance but will be decided upon by the Engineer as occasion demands.

The sewer line may be moved within the limits of the street and takings wherever thought best by the Engineer.



This is to certify that this record drawing has been carefully made from actual field notes recorded in Books No. 67 & 93

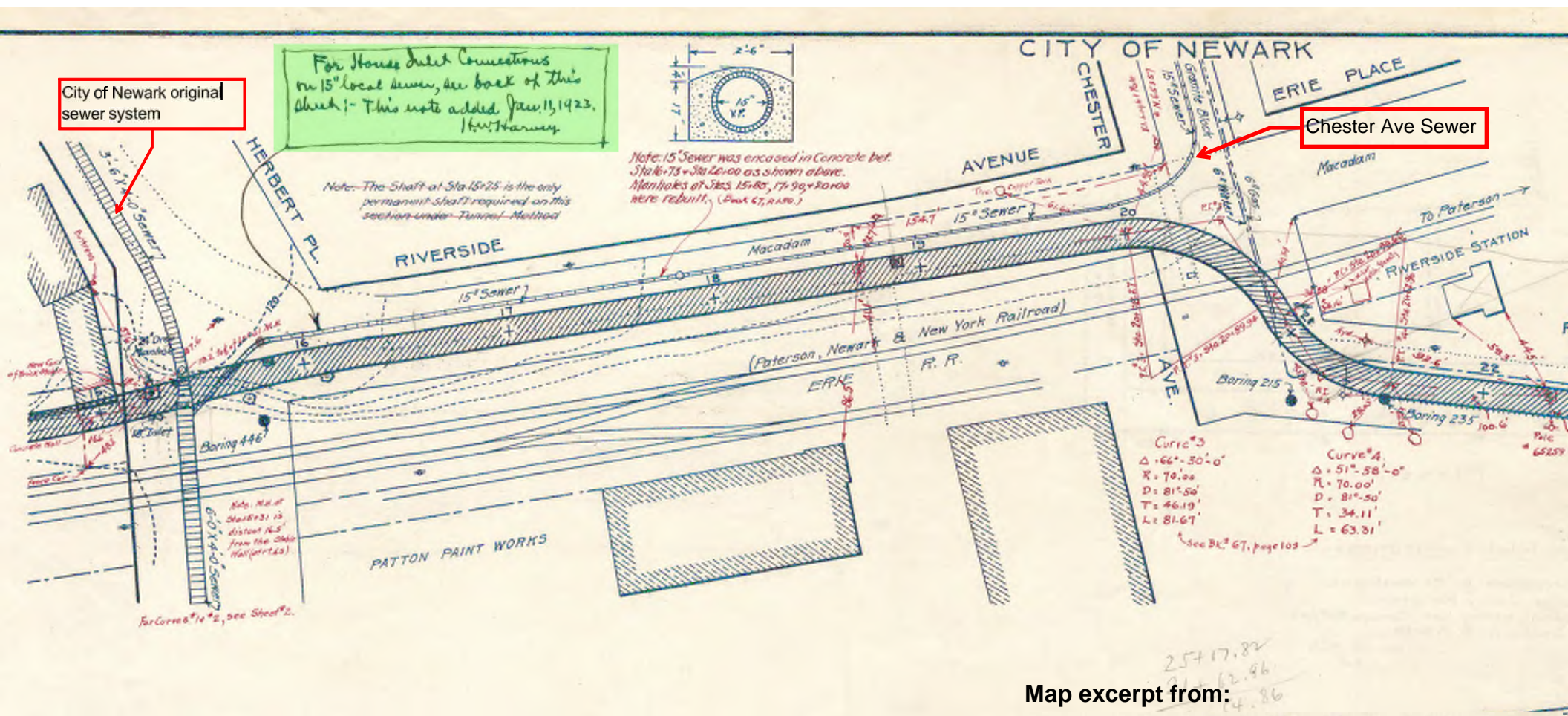
Wm. J. McMan
Division Engineer, Assistant Engineer.

Wm. J. McMan
Chief Engineer
Wm. J. McMan
Principal Assistant Engineer

State of New Jersey
PASSAIC VALLEY SEWERAGE COMMISSIONERS
MAIN INTERCEPTING SEWER
CONTRACT DRAWINGS: ALTERNATE METHODS
NORTHERLY PORTION OF SECTION 8—CITY OF NEWARK
PLAN AND PROFILE

STATION 16 TO STATION 24
JANUARY 1, 1915

1a



Map excerpt from:

State of New Jersey
PASSAIC VALLEY SEWERAGE COMMISSIONERS
MAIN INTERCEPTING SEWER
CONTRACT DRAWINGS: ALTERNATE METHODS
NORTHERLY PORTION OF SECTION 8—CITY OF NEWARK
PLAN AND PROFILE

STATION 16 TO STATION 24

JANUARY 1, 1915

Acc. No. B 2093

CURVE#1
 $\Delta = 8^\circ 47' 08''$
 $R = 412.138$
 $L = 63.17'$
 $T = 31.66$
 $E = 1.22$

P.V.S.C.
 HERBERT PL.
 REGULATOR

HERBERT PL.

RIVERSIDE AVE.

ROUTE 21
 SOUTHBOUND

ROUTE 21
 NORTHBOUND

CHESTER AVE. RAMP

GUARD RAIL

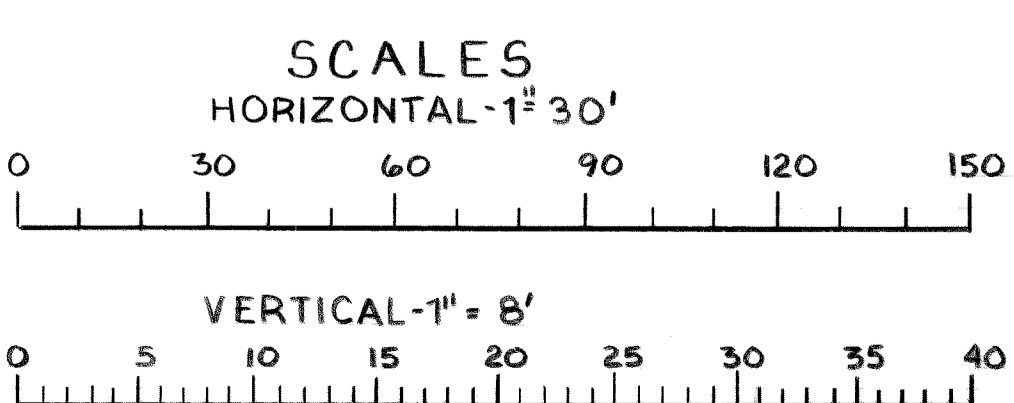
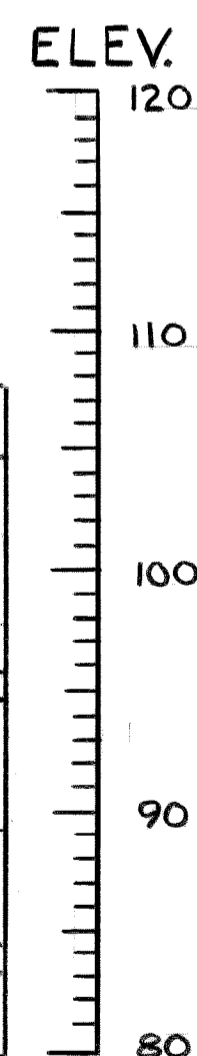
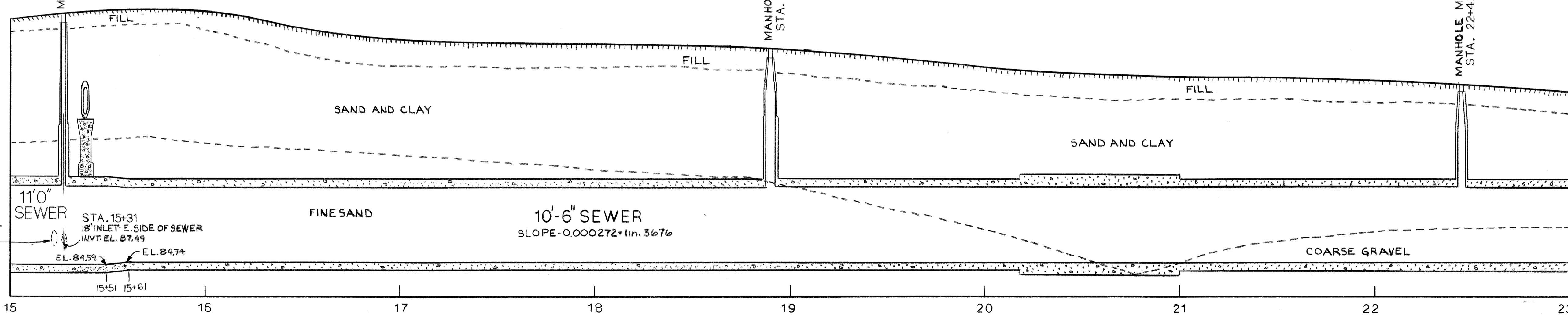
MAIN INTERCEPTING SEWER

CURVE#2
 $\Delta = 9^\circ 07' 56''$
 $R = 396.43'$
 $L = 63.19$
 $T = 31.66$

CURVE#3
 $\Delta = 66^\circ 50' 0''$
 $R = 70' 00$
 $D = 81^\circ 50'$
 $T = 46.19'$
 $L = 81.67'$

CURVE#4
 $\Delta = 51^\circ 58' 0''$
 $R = 70.00'$
 $D = 81^\circ 50'$
 $T = 34.11'$
 $L = 63.31'$

RIVERSIDE AVE.
 22

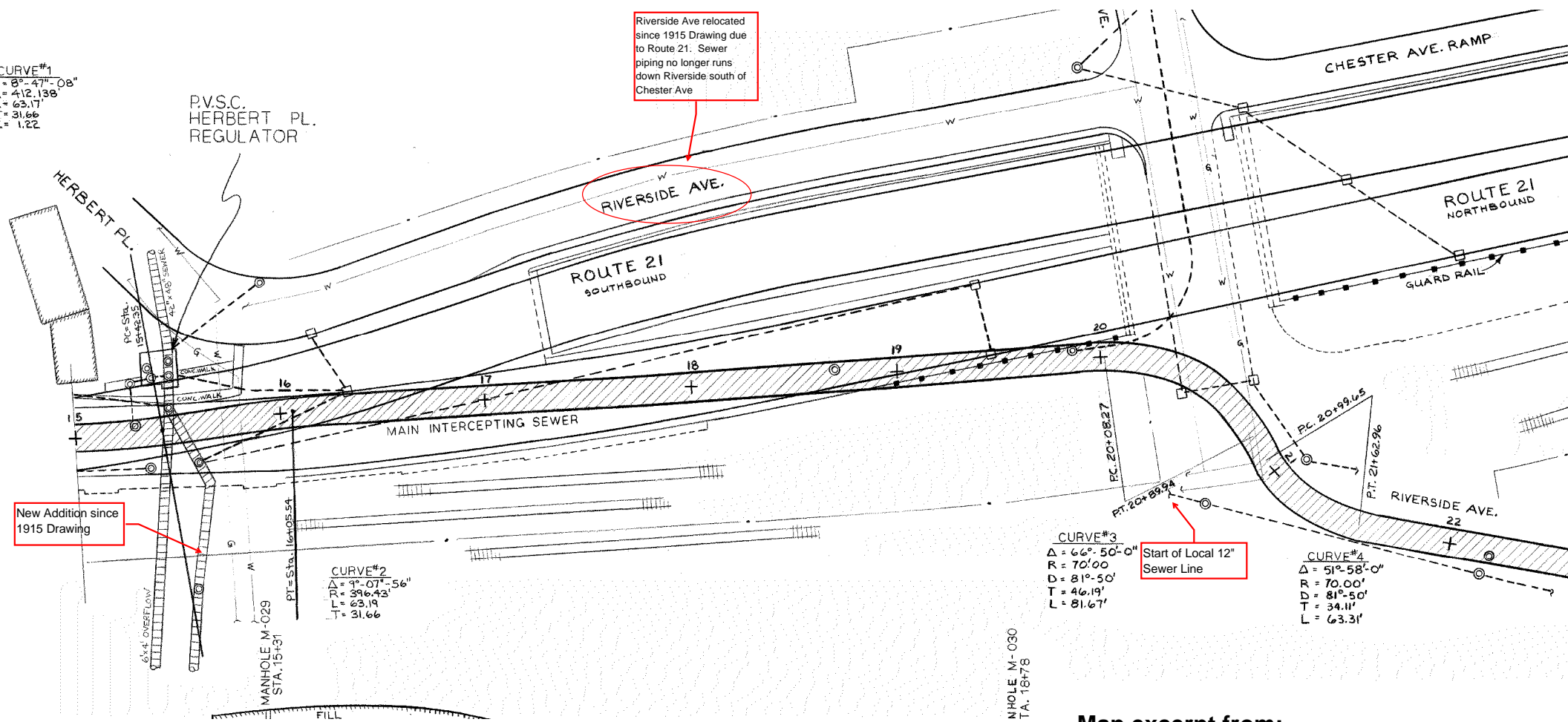


REFERENCE:

- CONTRACT 56-SECTION 8
 NORTHERLY PORTION-
 CITY OF NEWARK
 DRAWING No. B-2092, B2093
- N.J. HIGHWAY DEPT.
 ROUTE 21 PLANS, 1953
 DRAWING No. 12 AND 13
 68 68

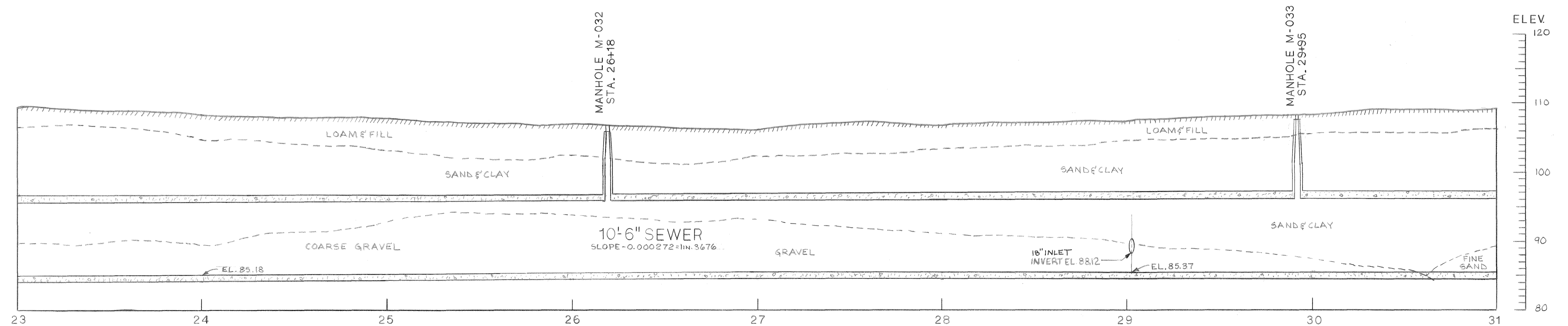
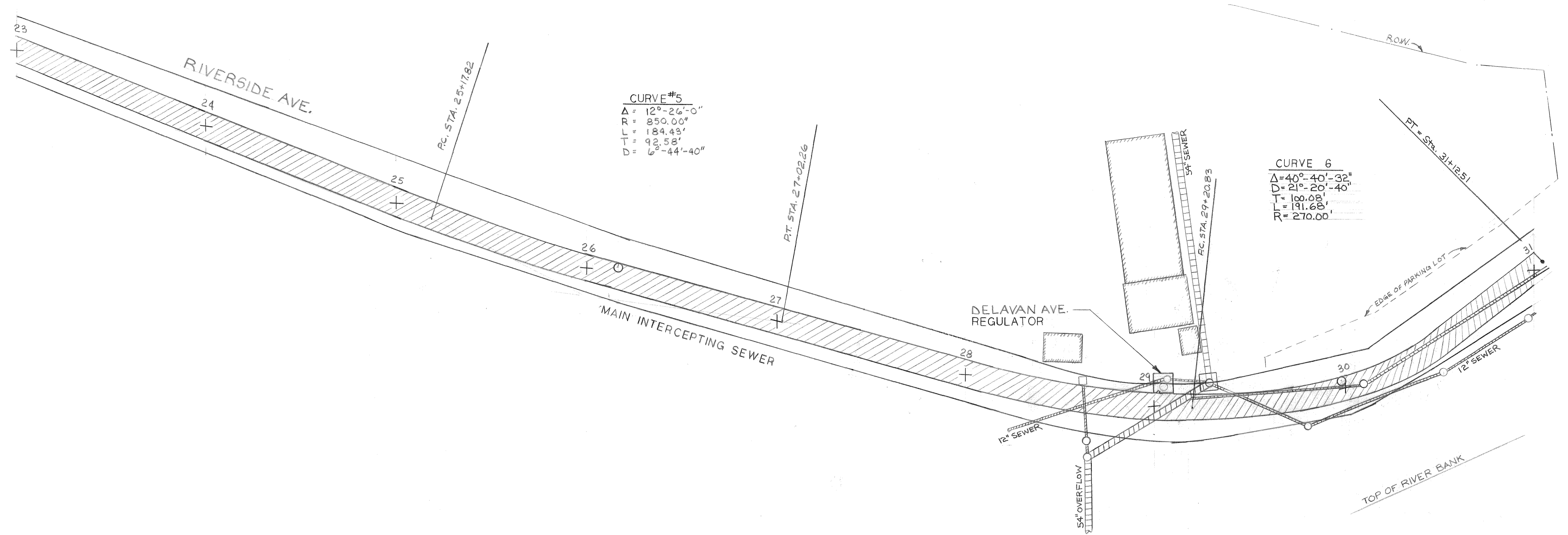
PASSAIC VALLEY SEWERAGE COMMISSIONERS			
SCALE: AS NOTED	APPROVED BY:	DRAWN BY:	
DATE:		REVISED:	
MAIN INTERCEPTOR- NEWARK			
SECTION - 8 N			DRAWING NUMBER MI-28

2a



Map excerpt from:

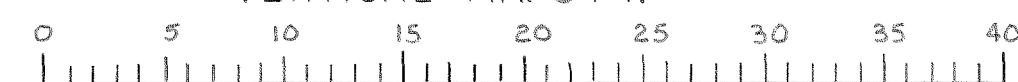
PASSAIC VALLEY SEWERAGE COMMISSIONERS		
SCALE: AS NOTED	APPROVED BY:	DRAWN BY
DATE:		REVISED
MAIN INTERCEPTER- NEWARK		
SECTION - 8N		DRAWING NUMBER MI-28



SCALES
 HORIZONTAL - 1 IN. = 30 FT.



VERTICAL - 1 IN. = 8 FT.



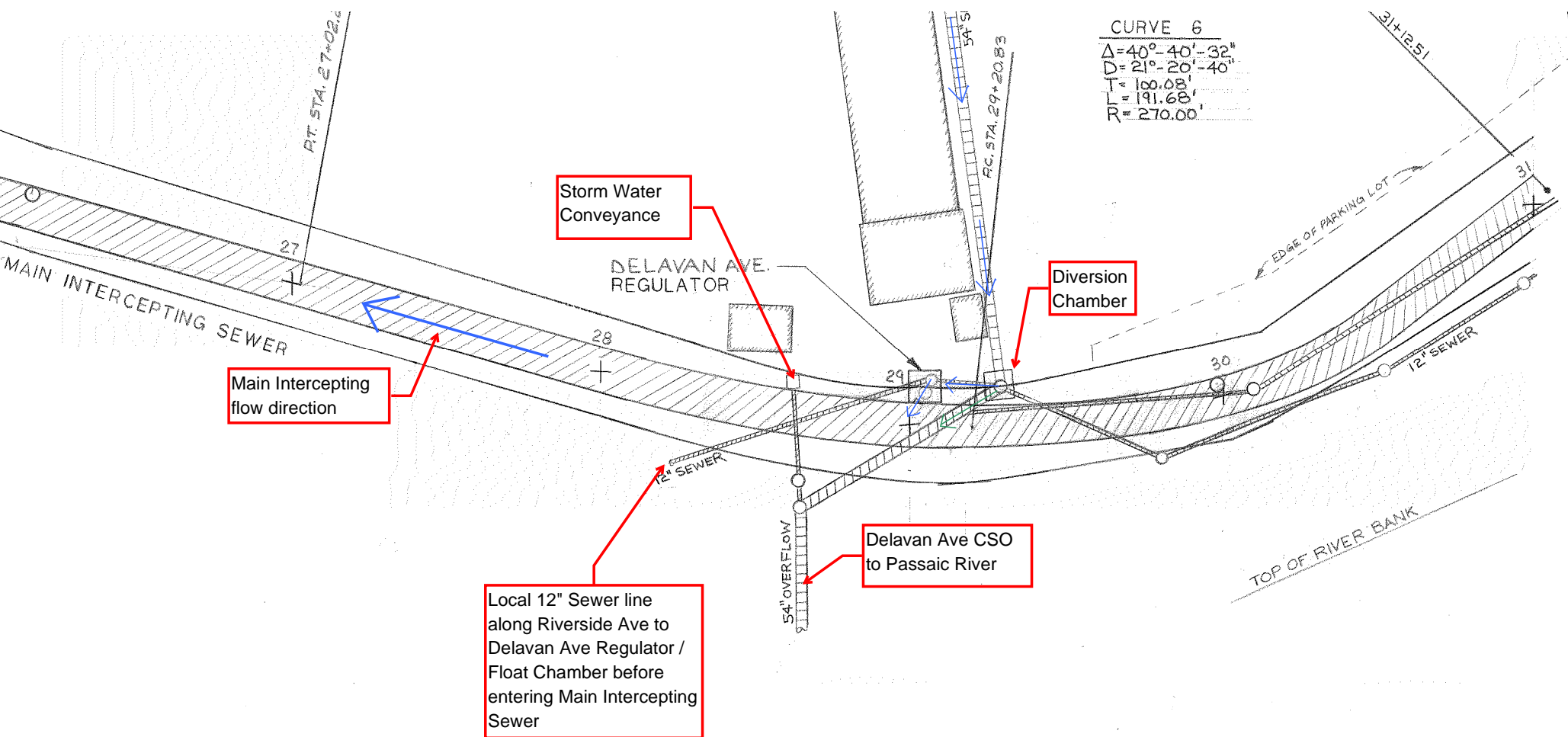
REFERENCE:

1. CONTRACT 56-SECTION 8
NORTHERLY PORTION - CITY
OF NEWARK - DRAWING No. B-2094
2. N.J. HIGHWAY DEPT. - ROUTE
21 PLANS - 1953
DRAWING No. 14
68

MAIN INTERCEPTER - NEWARK

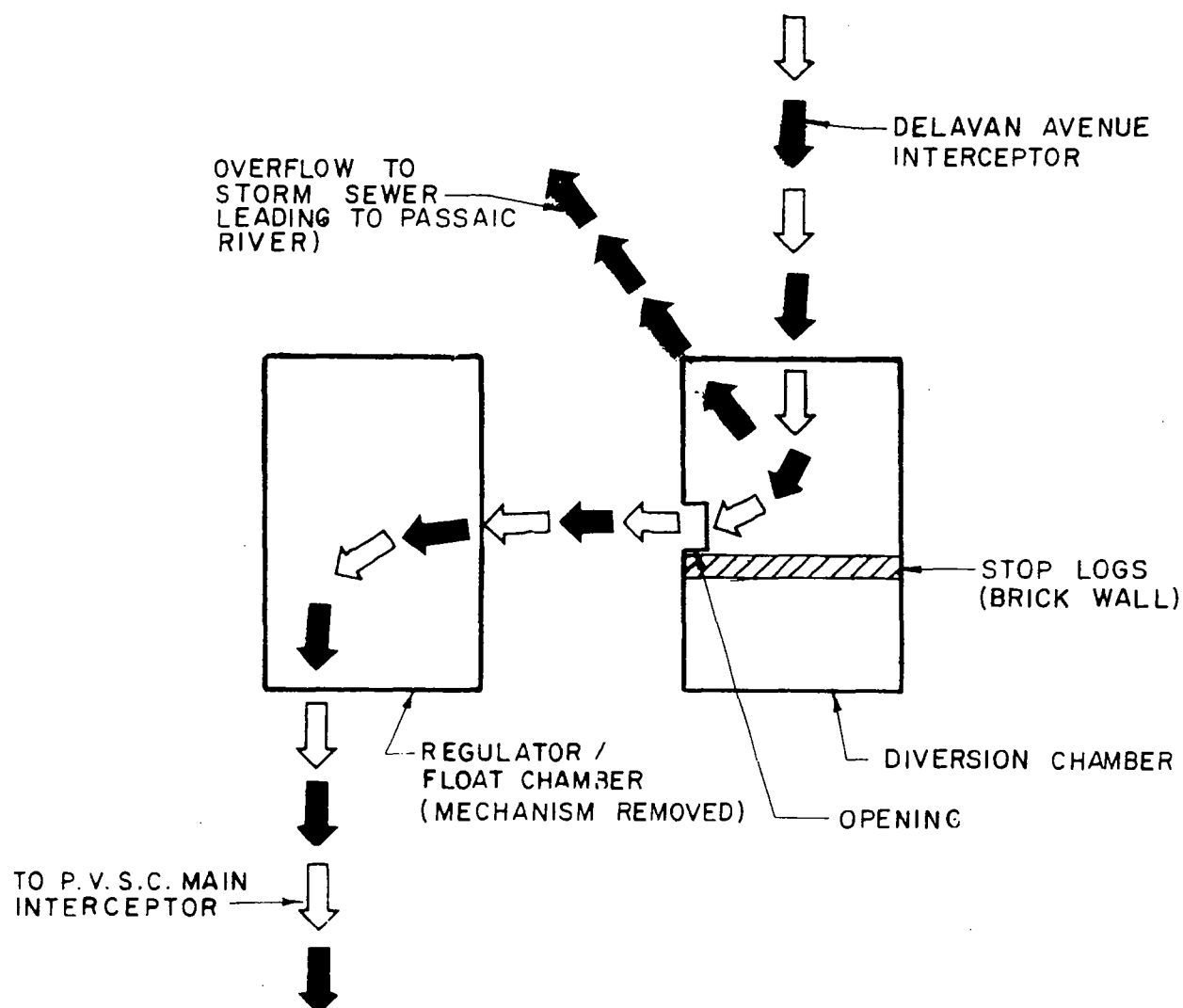
SCALE: AS NOTED	APPROVED BY:	DRAWN BY: PZANGAR
DATE:	REVISION:	
PASSAIC VALLEY SEWERAGE COMM.		
SECTION - 8N		DRAWING NUMBER MI-29

3a



Map excerpt from:

MAIN INTERCEPTER - NEWARK		
SCALE: AS NOTED	APPROVED BY:	DRAWN BY: PZANGAR
DATE:	REVISED:	
PASSAIC VALLEY SEWERAGE COMM.		
SECTION - 8N		DRAWING NUMBER MI-29



LEGEND

-  DRY WEATHER FLOW
 STORM FLOW / OVERFLOW

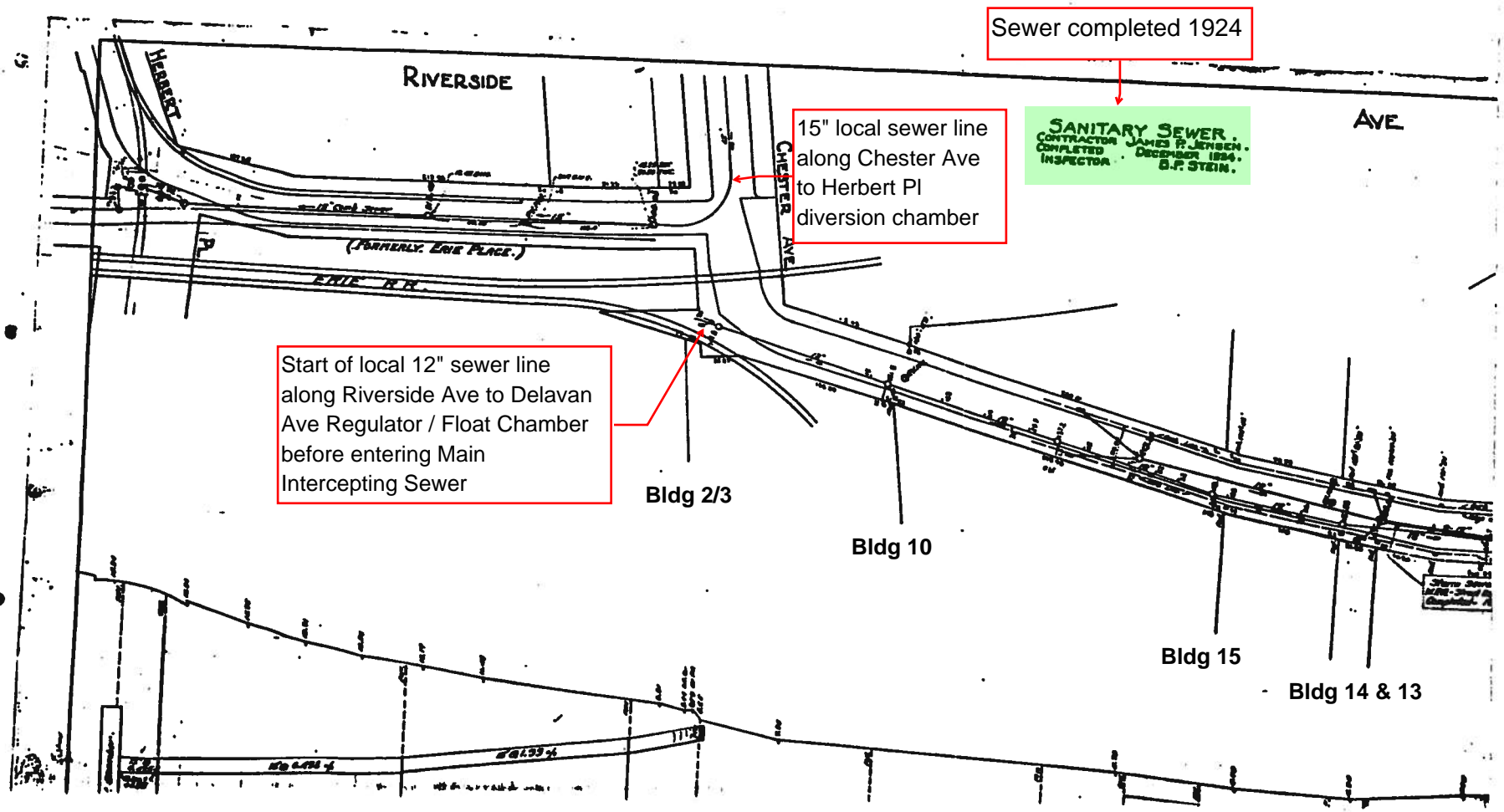
PASSAIC VALLEY SEWERAGE COMMISSIONERS
 DELAVAN AVENUE, NEWARK

SCHEMATIC

ELSON T. KILLAM ASSOCIATES, INC.
 Environmental and Hydraulic Engineers 100 Essex Street, Suite 200, Newark, New Jersey 07102

AHLO000073

5





12" Local
Riverside Ave Sewer

Start of sewer @
Chester/Riverside
Intersection

DEPARTMENT OF PUBLIC AFFAIRS
NEWARK, N. J.
BUREAU OF SEWERAGE

PROJECT NO. 100-1000
SHEET NO. 100-1000

DATE: 10-1-50

BY: J. J. JONES

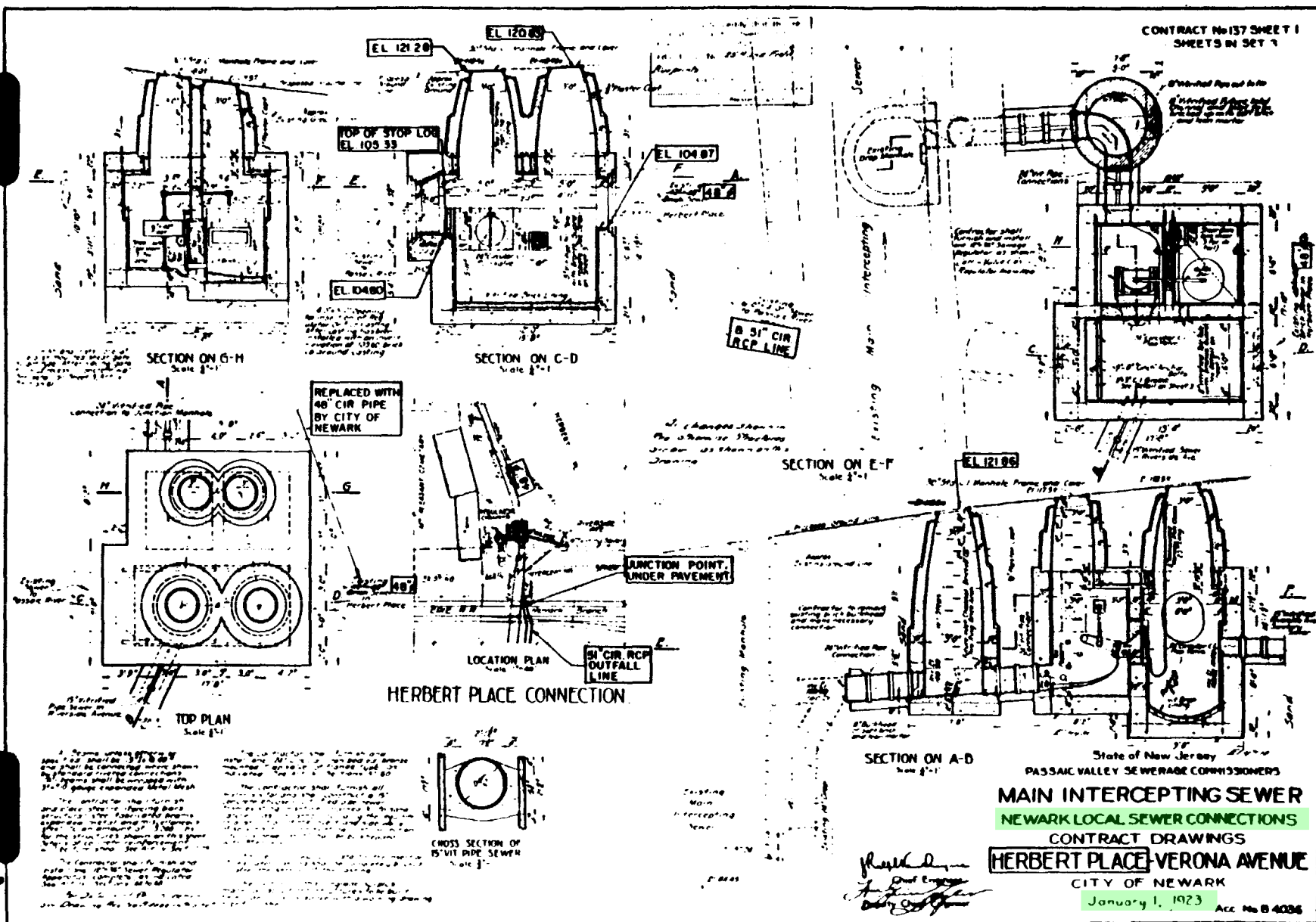
CHECKED BY: J. J. JONES

APPROVED BY: J. J. JONES

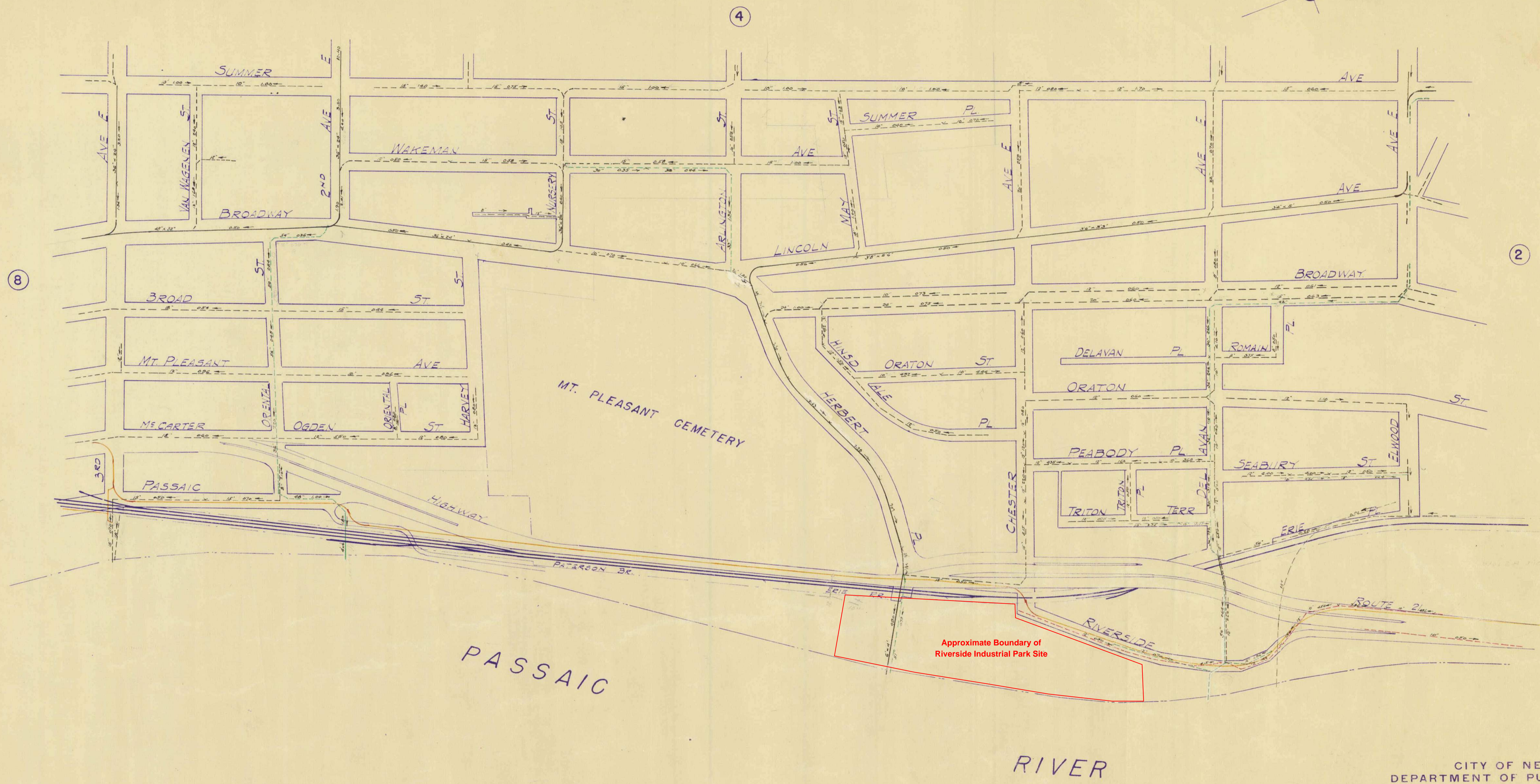
SCALE: 1" = 40'

NOTES: SEE SHEET 100-1000

100-1000



Local Sewer and Main PVSC Intercepting Sewer



CITY OF NEWARK
DEPARTMENT OF PUBLIC WORKS

SCALE: 1" = 200'

DATE

ENGINEER

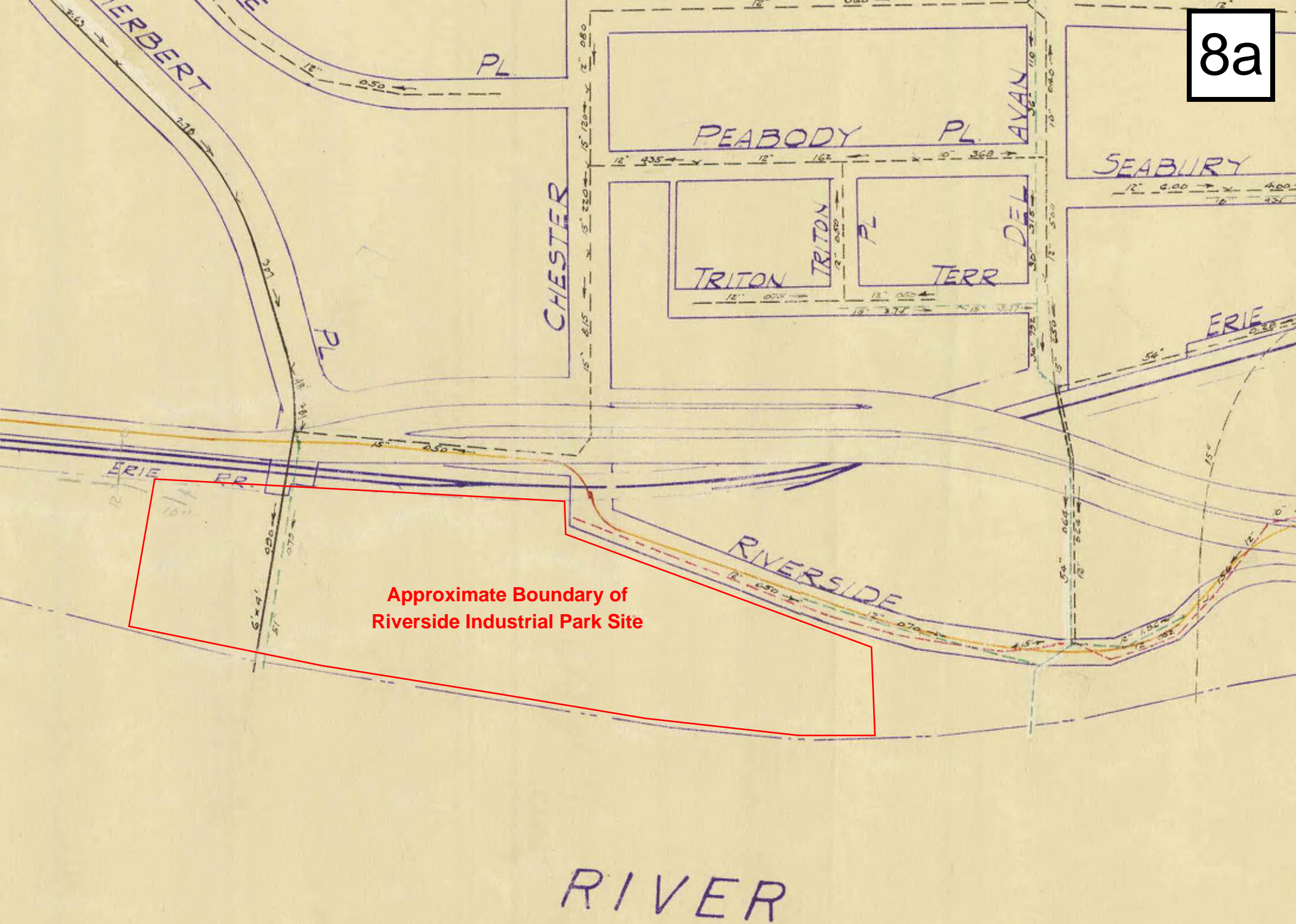
CHIEF ENGINEER

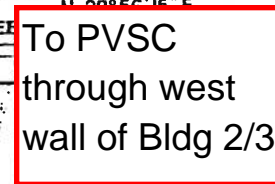
DRAWING NO.

5

DRAWN BY J.H.E.
CHECKED BY

DESIGNING ENGINEER





LEGEND

CCI use of new and existing sewers

1 - 6" PVC Pipe from CCI

2 - 5' Sunip, 6" PVC Pipe

3 - 7' Sump, 6" PVC Pipe

4 - 6" PVC Pipe to Junction Box

5 - 8' Sump w/ Reserve Pump to PVSC:

Ardmore Chemical Company, Inc.
29 Riverside Ave Bldg #14
Newark NJ 07104

10

Total Flow

Total Regulated Flow

Average Flow

Average Regulated Flow

Max Flow

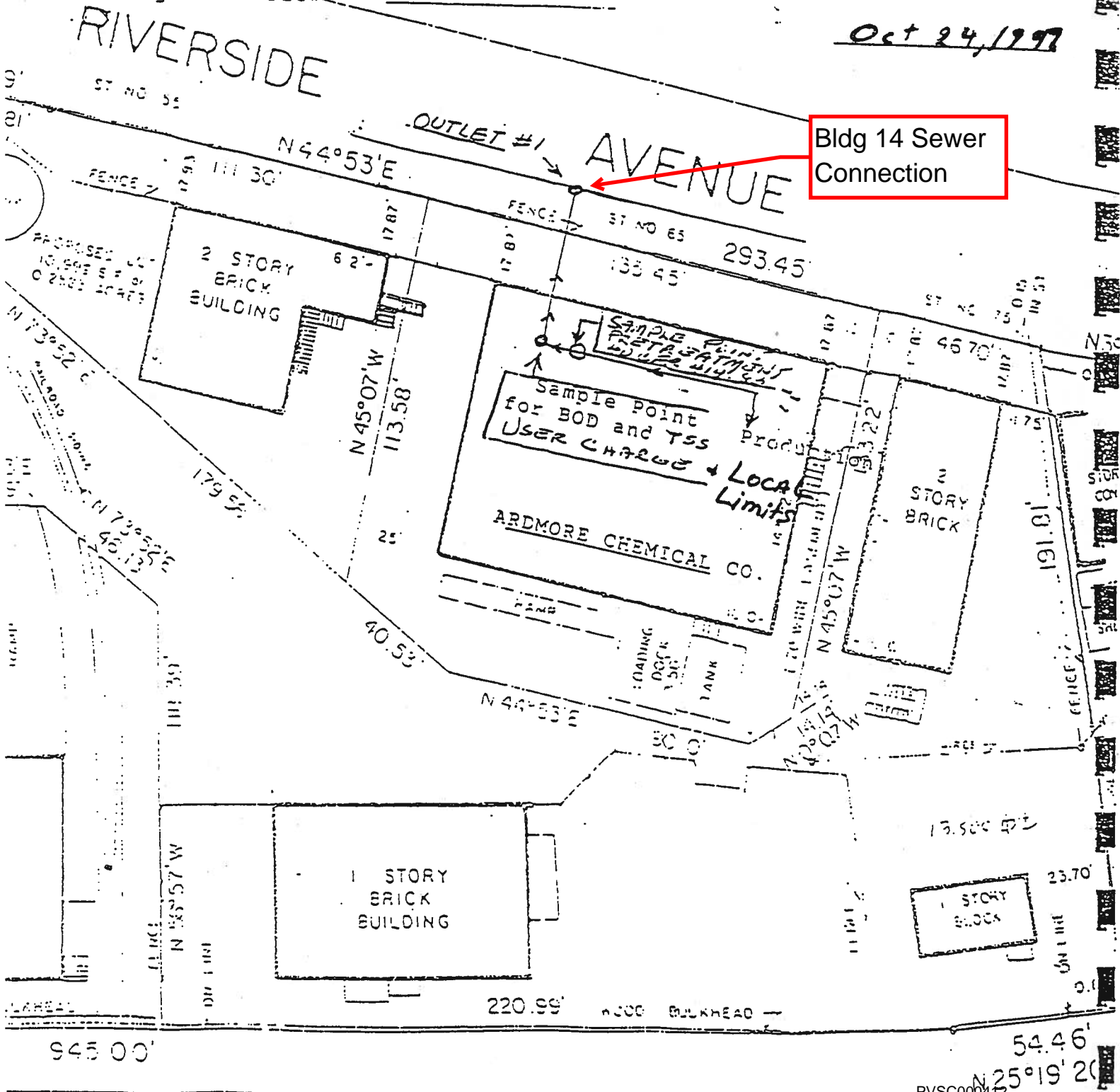
Max Regulated Flow

Albert Sharpouse

Albert Sharpouse
President

Oct 24, 1977

Bldg 14 Sewer
Connection



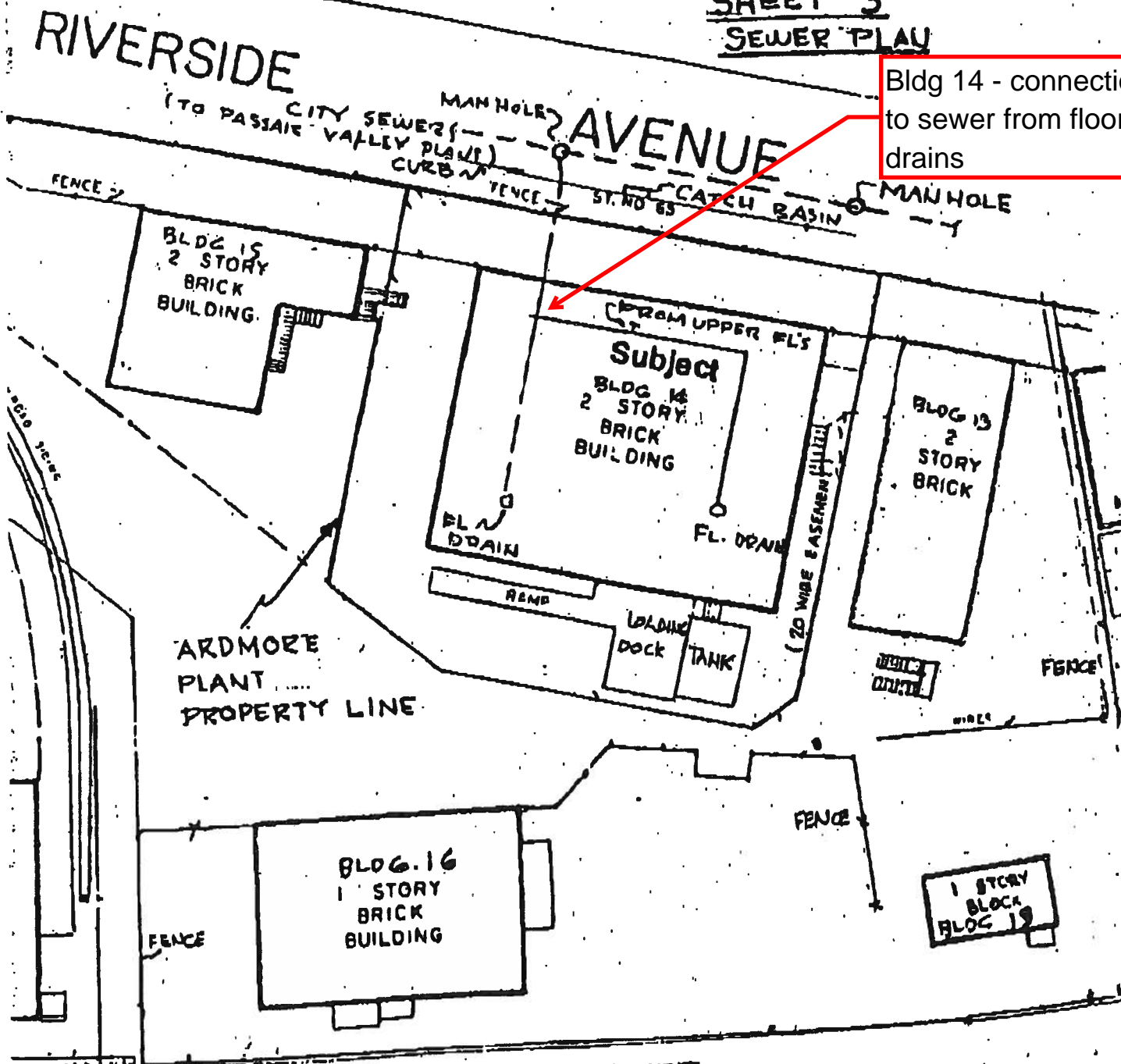
PROPOSED SUBDIVISION

PVSC000412
SCORIE MCDON



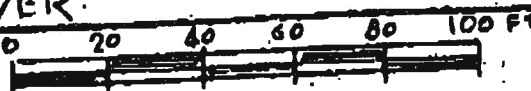
SHEET 3
SEWER PLAN

Bldg 14 - connections
to sewer from floor
drains



ARDMORE CHEMICAL CO.
20 RIVERSIDE AVENUE

SCALE:



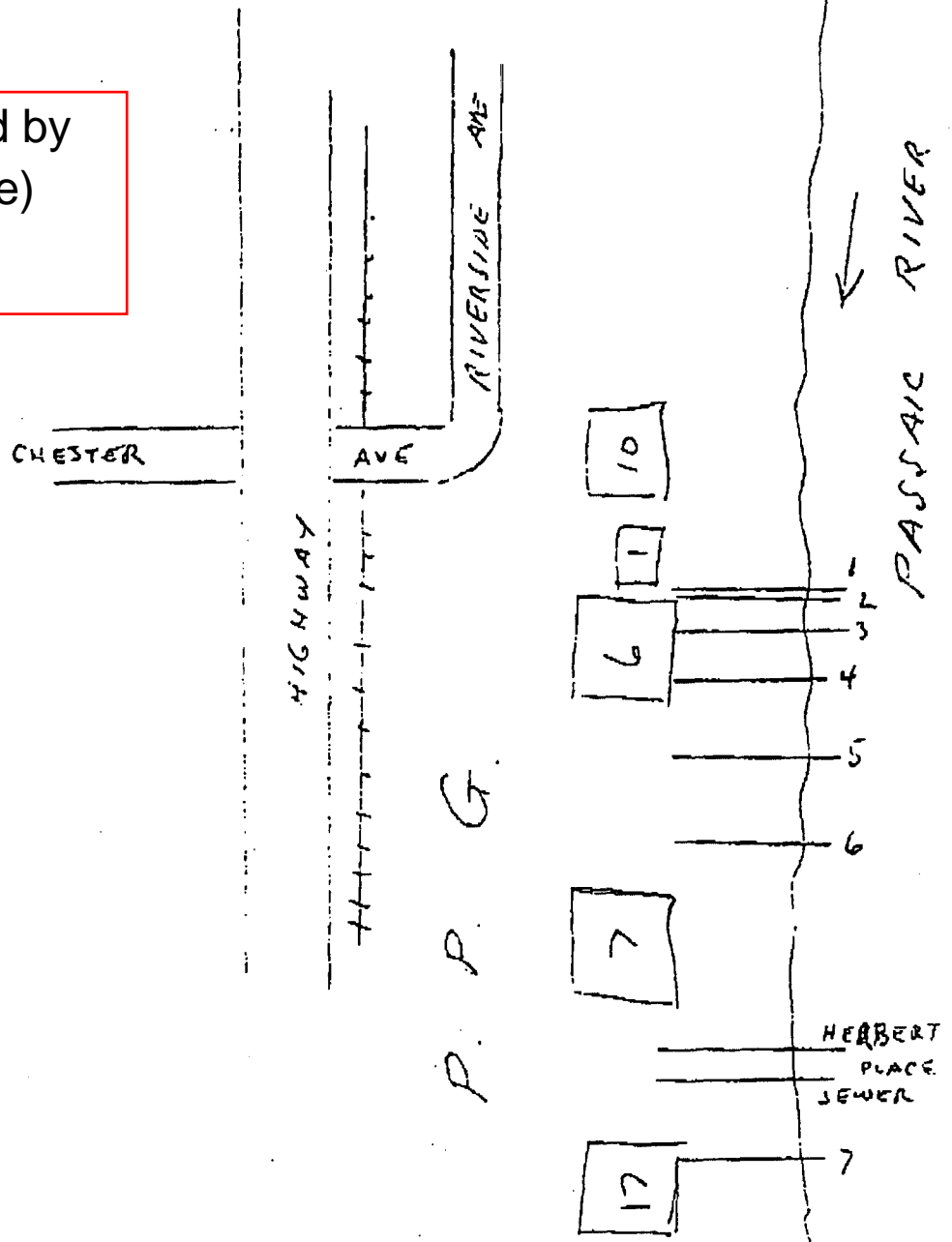
Arthur F. Strubbe
12/6/95

P.P.G. Industries, Inc. (Formerly Pittsburgh Plate Glass)

There are 7 outlets from this company to the river.

1. Opening in bulkhead, storm drain.
 2. 10" drain line from water tank on Building #10.
 3. 4" outlet which contains cooling water from air compressor and after cooler.
 4. 4" outlet containing cooling water from air compressor and after cooler.
 5. 9" x 10" outlet plugged.
 6. 7" jacket cooling water outlet.
 7. Obsolete line. (Plugged)
- (Firm closing March 1, 1971.)

Document provided by
PVSC. From (Name)
PVSC notebook



KLL003737

852910014

APPENDIX C: PPG BUILDING BLUEPRINTS AND SPECIFICATION

Plumber

PLUMBER'S SPECIFICATION:-

For Five Story building.

CAST IRON PIPE:-

All joints between cast iron pipe are to be thoroughly caulked with oakum and molten lead with full joints. All joints between iron pipe and lead pipe must be made with heavy brass ferrules of the same size as the lead pipe and soldered to same and caulked into the iron pipe.

Furnish and place where shown two 5" ex. heavy cast iron leader pipes. Connect same with the gutter of roof with heavy 5" copper tubing flanged out in the gutter and connected in the best manner with the 5" cast iron pipe. Continue the 5" cast iron leaders as shown to first floor, then beneath the floor along the brick walls and through same to the outside of building. Connect a 5" cast iron soil pipe with the 5" cast iron pipe under first floor where shown at the north east corner of building, and continue same to second floor and then reduce to a 4" cast iron pipe to a height of 4' above roof leaving out branches on this line for fixture connections. Where the cast iron pipe continues along the brick wall it will be supported in the best manner from same by wrought iron straps bolted around the iron pipe and anchored into the brick wall. Connect a 2" cast iron pipe with the soil pipe below the lowermost fixture and continue same to a height of 4' above the roof line. Increase the size of same as the line extends up and leave out branches at each floor for venting the fixtures. Run a separate vent pipe for the closet and basin under stairs on first floor. After the iron pipe is conducted outside of the building it will be connected in the best manner with an 8" salt glazed tile drain pipe.

TILE PIPE:-

The contractor will excavate a trench from the leader connections outside of building and furnish and lay in the best

manner an 8" salt glazed tile drain pipe leading from the iron pipe connecting to the sewer 163' from the north west corner of building and properly connect with same. Fill in the trench after the tile drain pipe is laid.

WATER SERVICE:-

The contractor will have the water main in the street tapped at the nearest point to building and run a 2" water pipe into the building. Place a stop cock at curb and another one inside of building where directed, complete with waste, etc., Furnish and set a 2" waste water metre where directed. Furnish and place a 2" wrought iron stand pipe where directed for fire service. Continue same to fifth floor with 1 1/2" hose valves at each story. Connect the stand pipe with service pipe from street in a proper manner. Run service pipes from the 2" main under the first floor to supply the fixtures. All long runs to be made with galvanized iron pipe. The connections to fixtures to be made with regulation pipe.

WATER CLOSET:-

Furnish and set where shown in first story toilet room a ~~standard enameled~~ Standard, enameled on both sides, water closet and fixtures as shown on Plate 413 C. D. and in standard catalogue of 1901. Furnish and set where shown in toilet rooms above first story, six standard enameled water closets and fixtures as shown on plate 404 C. of the D. and M. Standard Catalogue of 1901. The supply and waste pipes for above six closets to be of lead pipe of the regulation weight. Connect all of the above fixtures with the water service and waste pipes in the best manner. All supply pipes to water tanks to have finished stops.

URINALS:-

Furnish and set where shown on second and fourth floors, two, two part urinals shown on Plate 702 R. of J. L. Mott's Plumbing Catalogue R., all complete with 2 gal. automatic flushing tank perforated brass flushing pipe/ Stall partitions, etc.,

BUILDING 4/5
EXTENSION
SPECIFICATIONS



Scale 1/4" = 1'-0"
1790 W 315
Sheet #2
JULY 10 1910

SIDE ELEVATION
FACTORY FOR THE PATTON PAINT CO.
NEWARK
N.J.

HOOPER & CO.
ARCHITECTS & ENGINEERS
NEWARK, N.J.

FRONT ELEVATION.

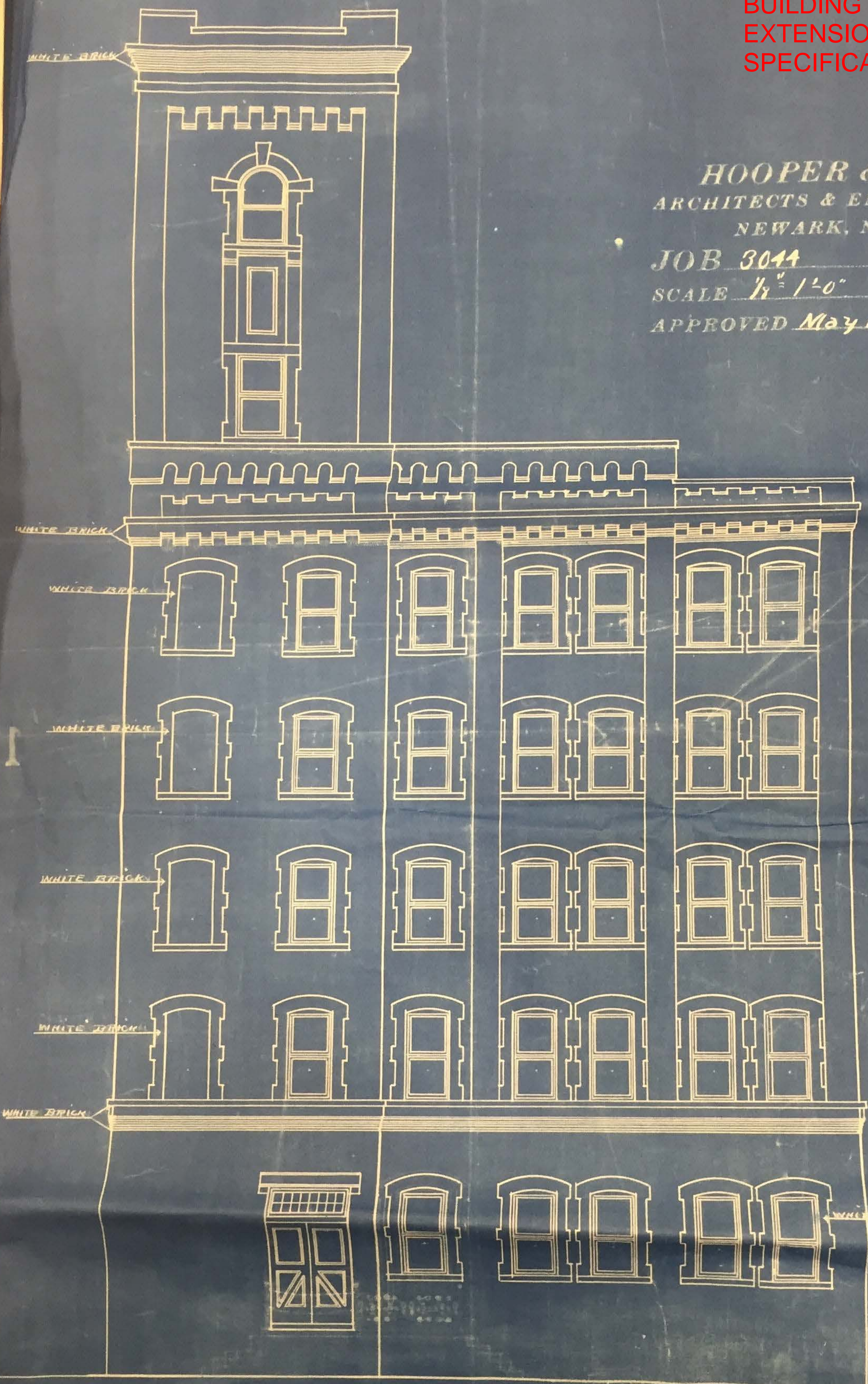
Extention to factory building,
for the Patton Paint Co.-
Newark, N.J.

HOOPER & CO.
ARCHITECTS & ENGINEERS
NEWARK, N. J.
JOB 3044
SCALE 1/4" = 1'-0"
APPROVED May 13, 1910.



HOOPER & CO.
ARCHITECTS & ENGINEERS
NEWARK, N. J.

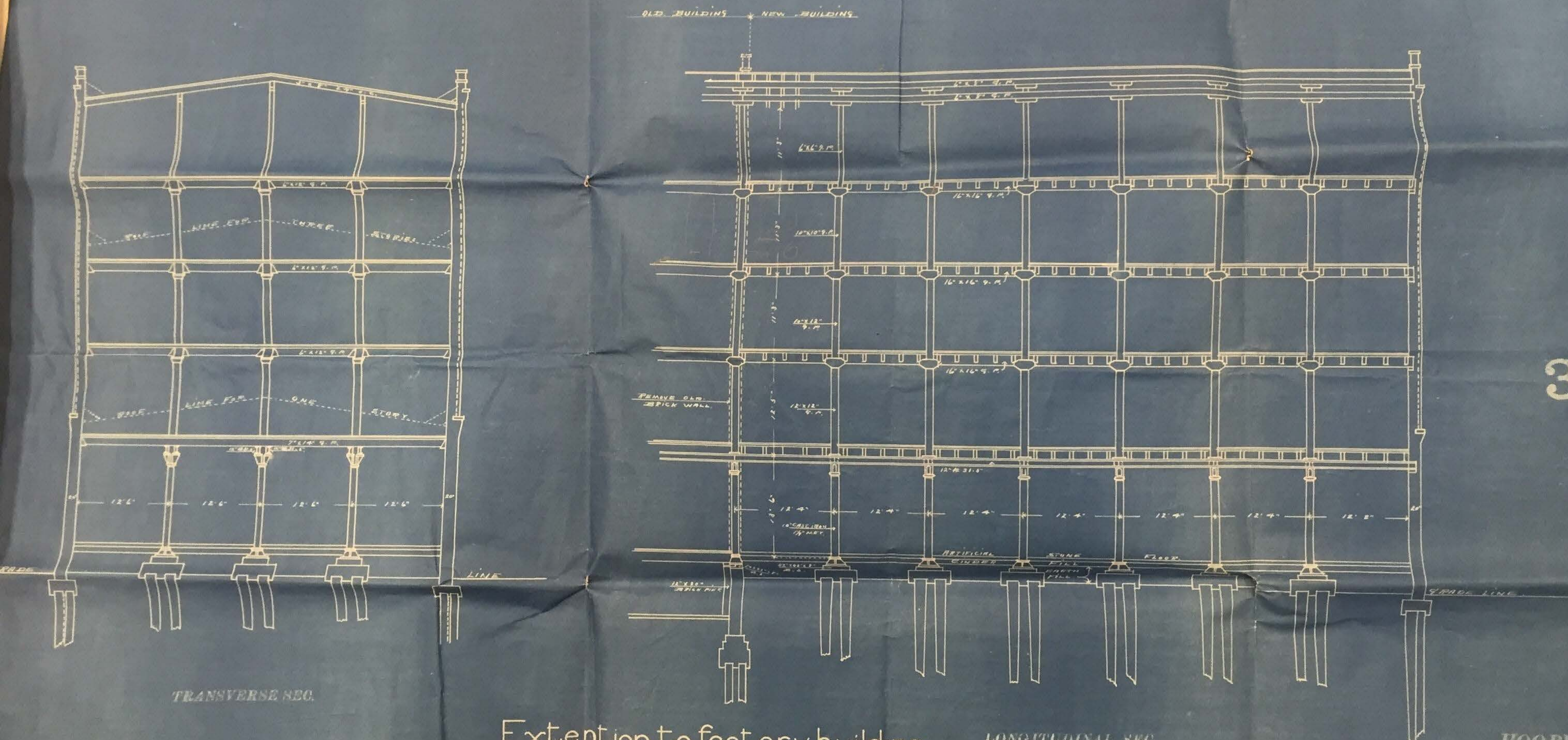
JOB 3044
SCALE $\frac{1}{4}" = 1'-0"$
APPROVED May 12, 1910.



END ELEVATION

Extension to factory building
for the-Patton Paint Co.-
Newark, N.J.

BUILDING 4/5
EXTENSION
SPECIFICATIONS



3

Extention to factory building,
for the-Patton Paint Co.-
Newark, N.J.

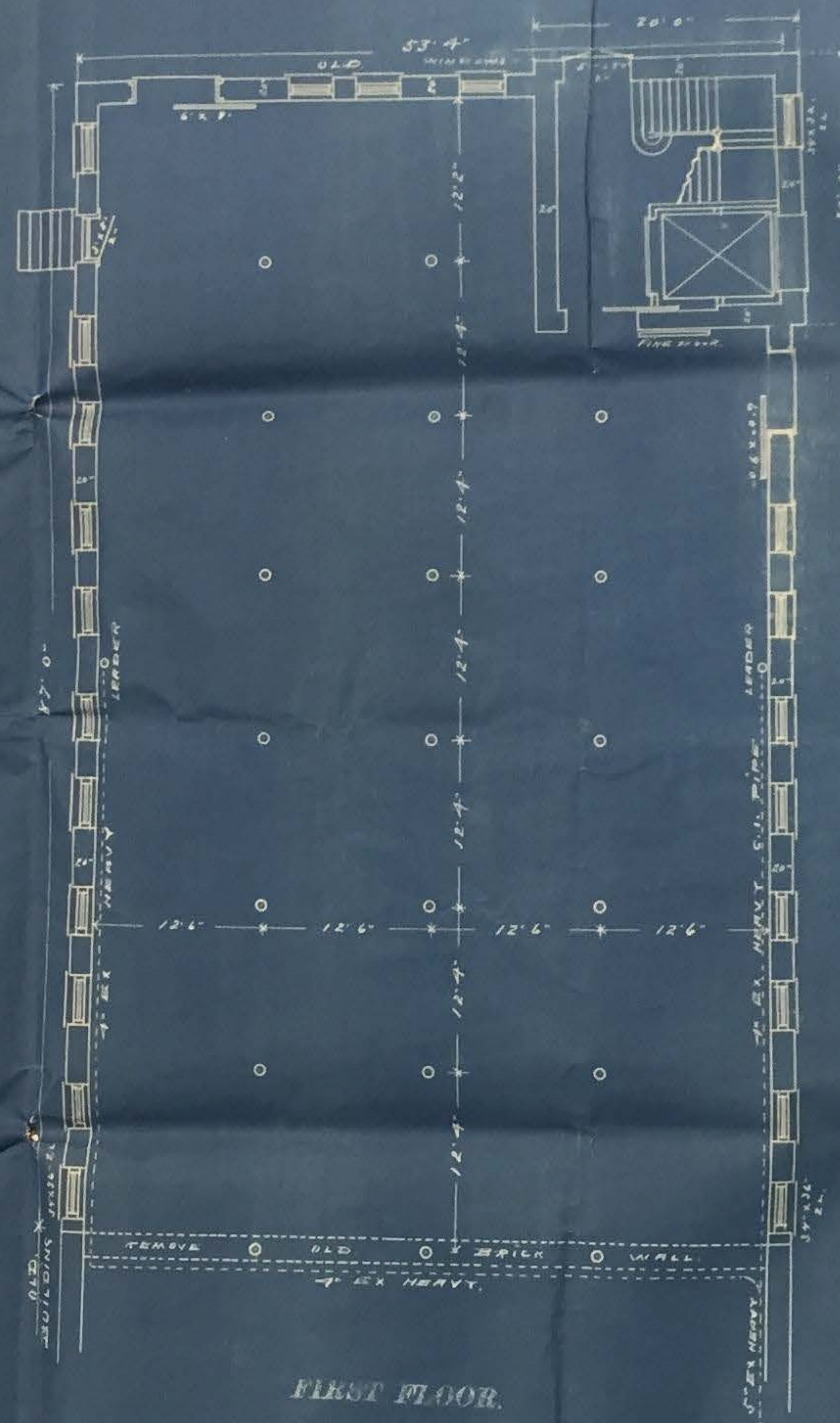
LONGITUDINAL SEC.

HOOPER & CO.
ARCHITECTS & ENGINEERS
NEWARK, N. J.
JOB 8044.
SCALE $\frac{1}{8}" = 1'-0"$
APPROVED May 19, 1910.

BUILDING 4/5
EXTENSION
SPECIFICATIONS



FOUNDATION PLAN



FIRST FLOOR.



SECOND FLOOR.

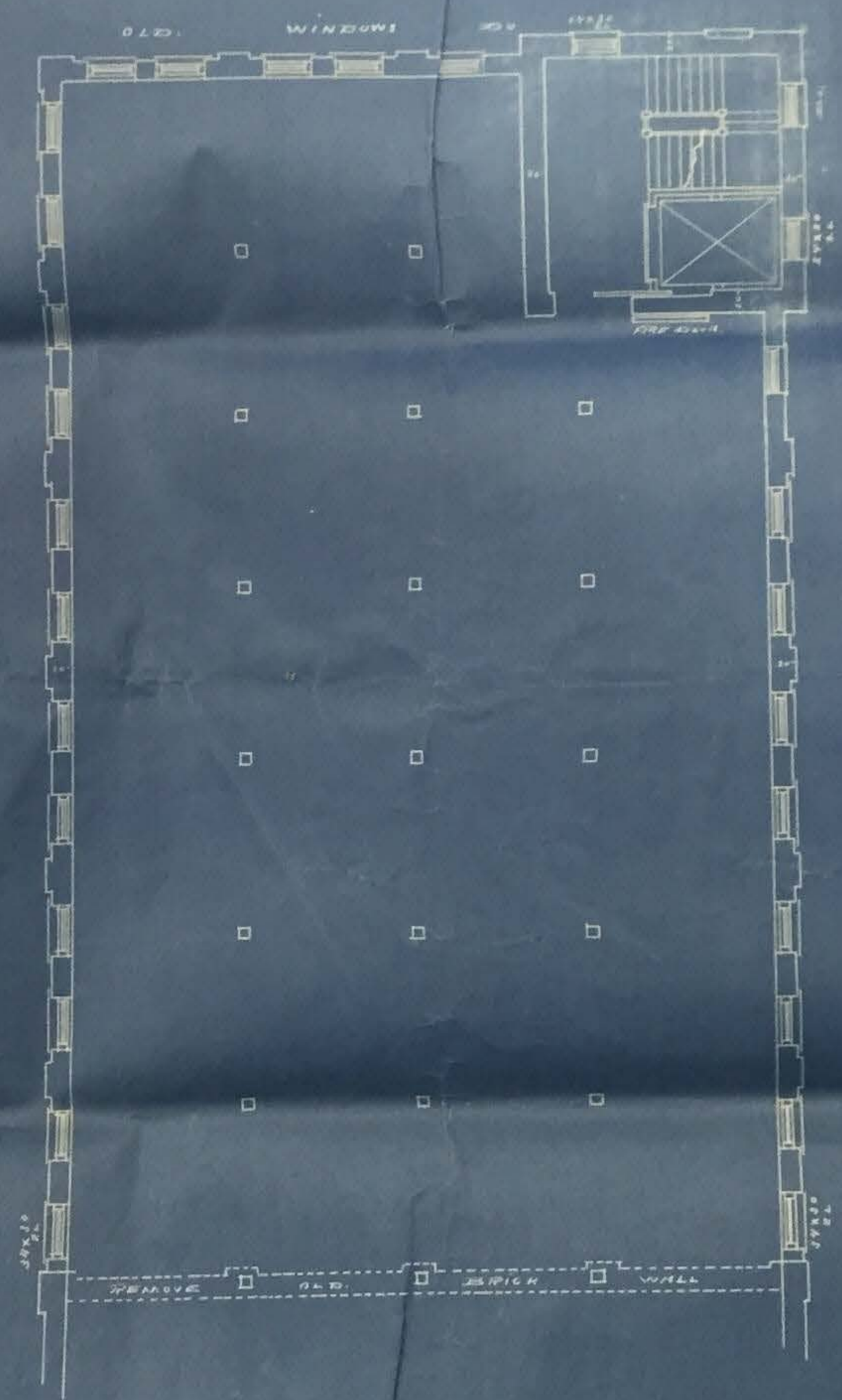
Extention to factory building,
for the-Patton Paint Co.-
Newark, N.J.

HOOPER & CO.
ARCHITECTS & ENGINEERS
NEWARK, N. J.
JOB 3044
SCALE $\frac{1}{8}'' = 1'-0''$
APPROVED May 18, 1910.

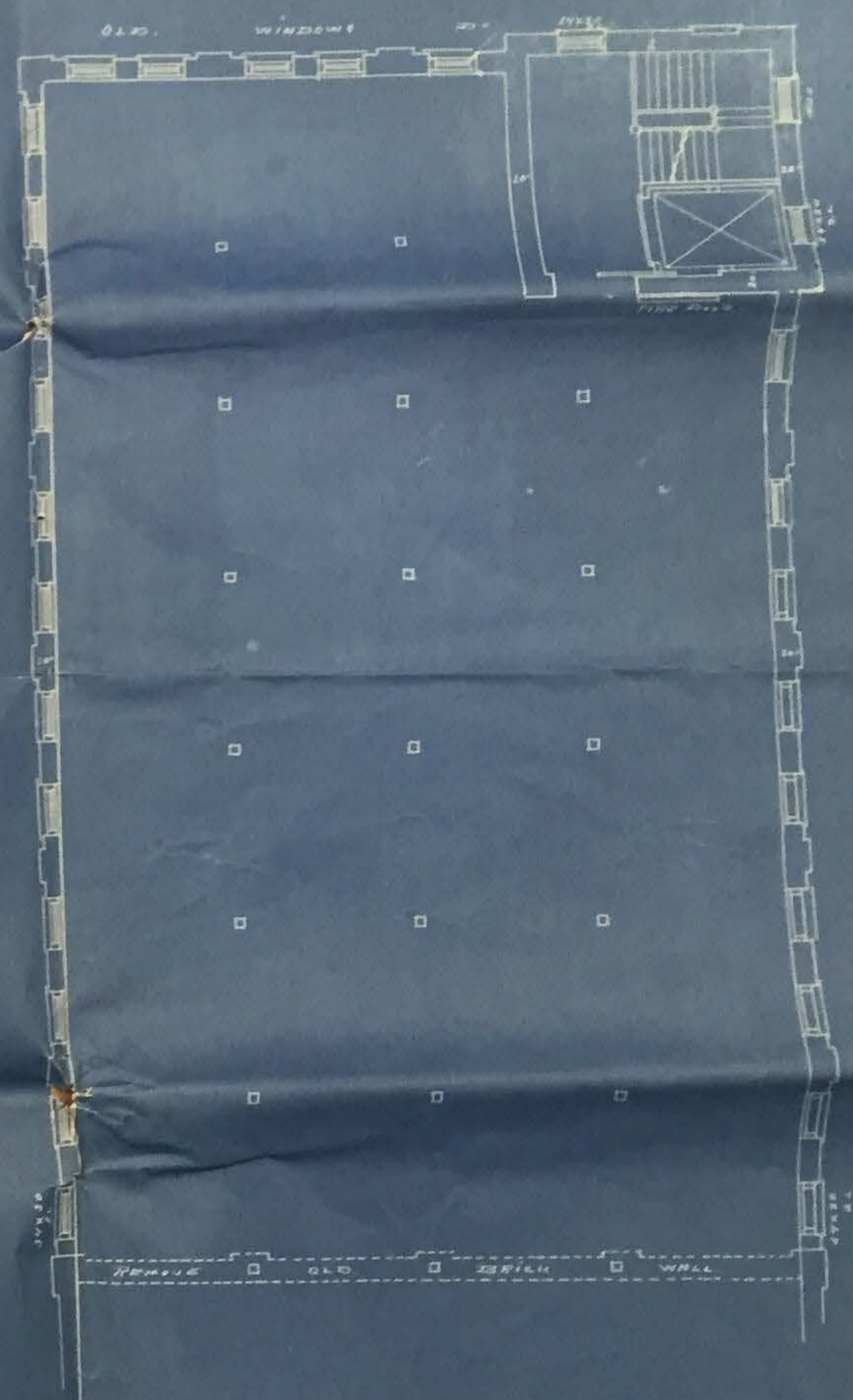
BUILDING 4/5
EXTENSION
SPECIFICATIONS



THIRD FLOOR.



FOURTH FLOOR.



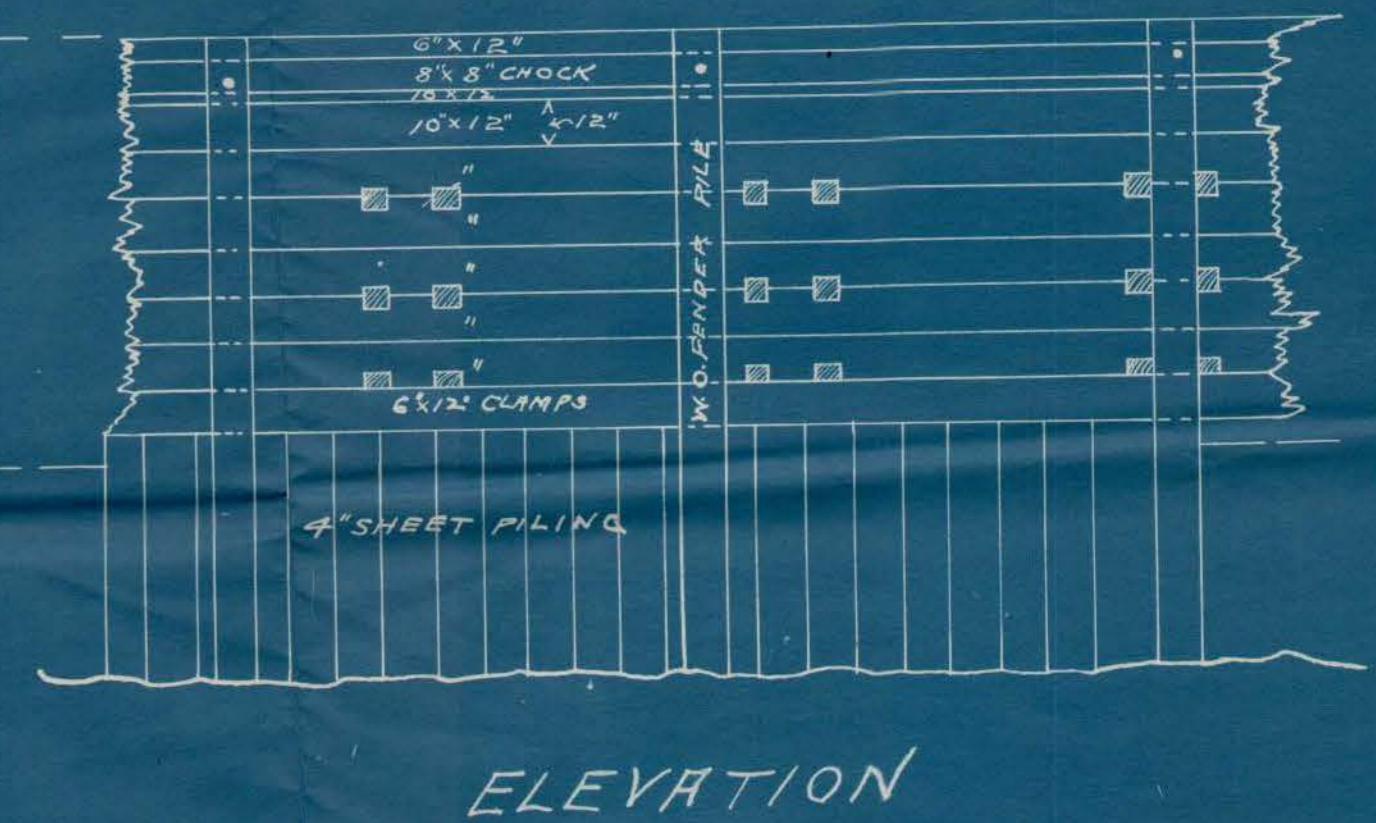
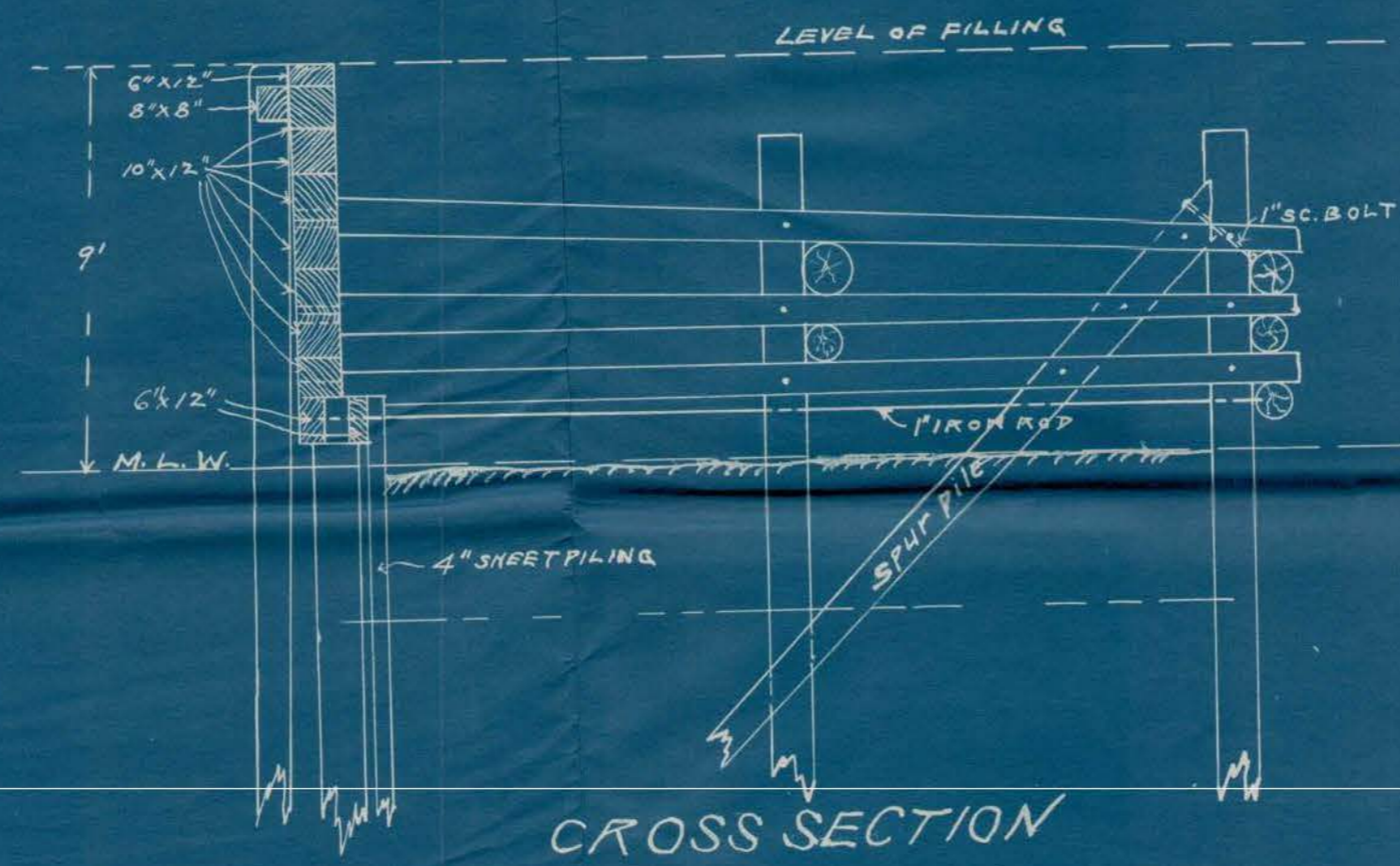
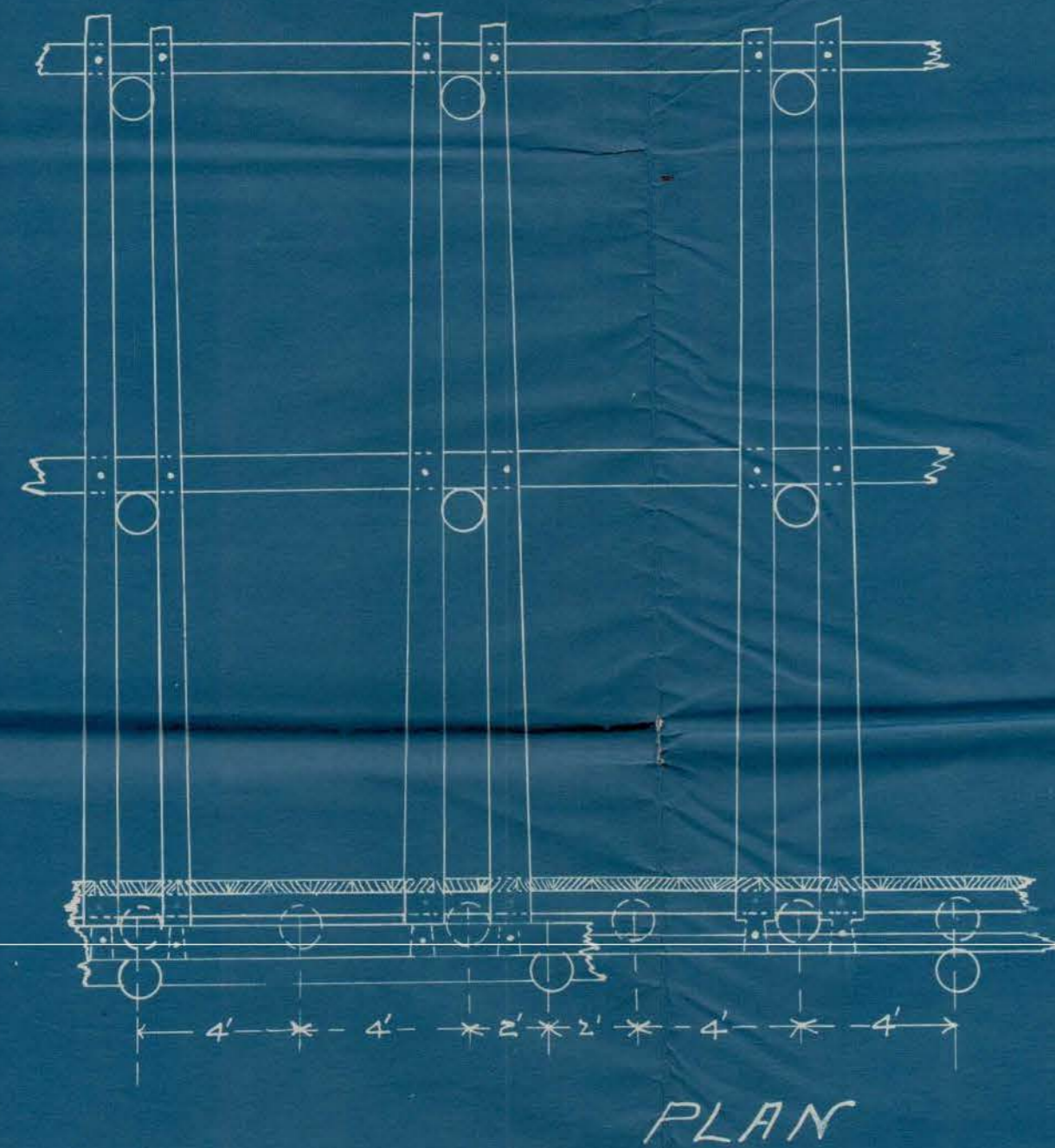
FIFTH FLOOR.

5

Extention to factory building,
for the-Patton Paint Co.-
Newark, N.J.

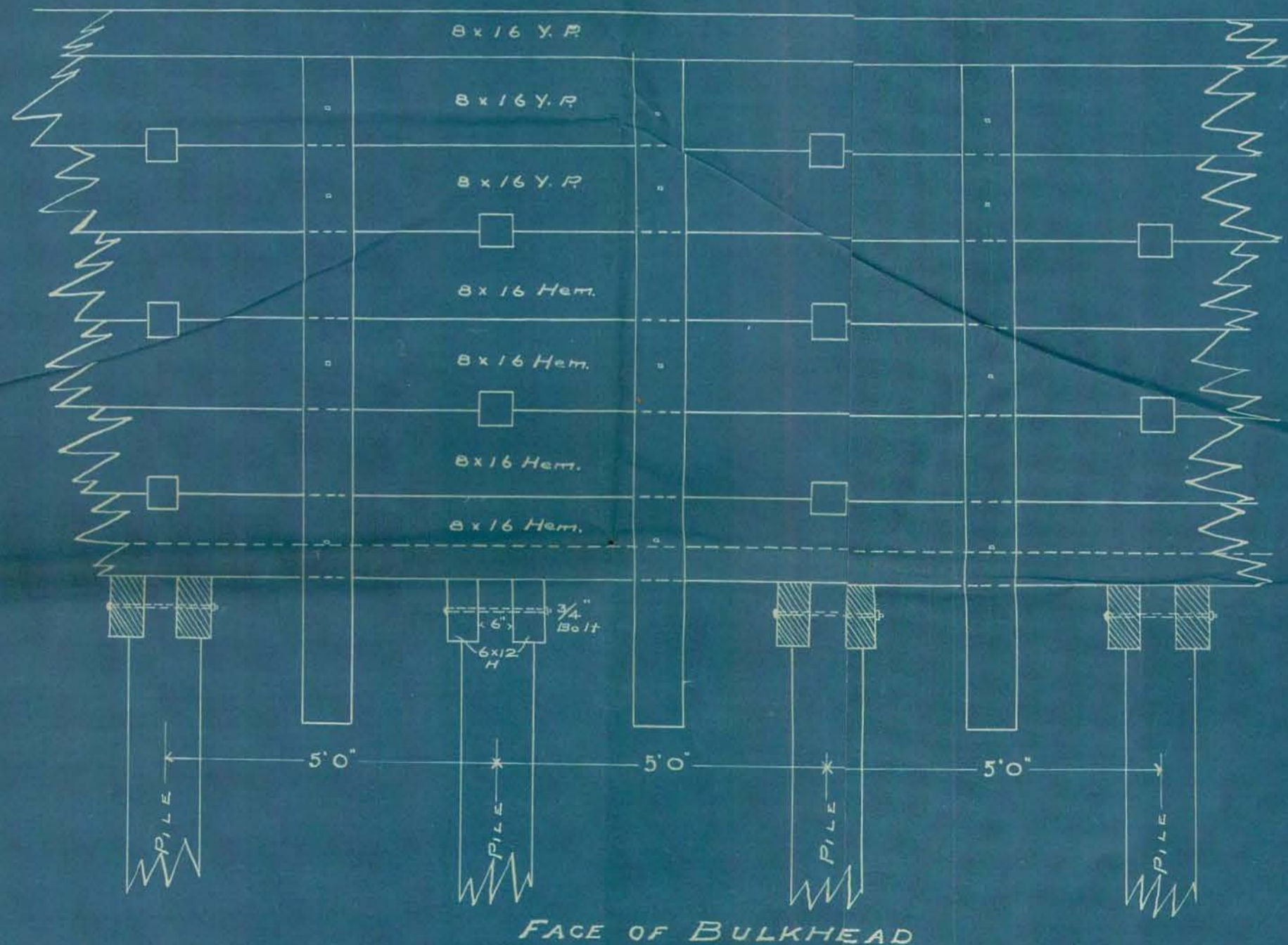
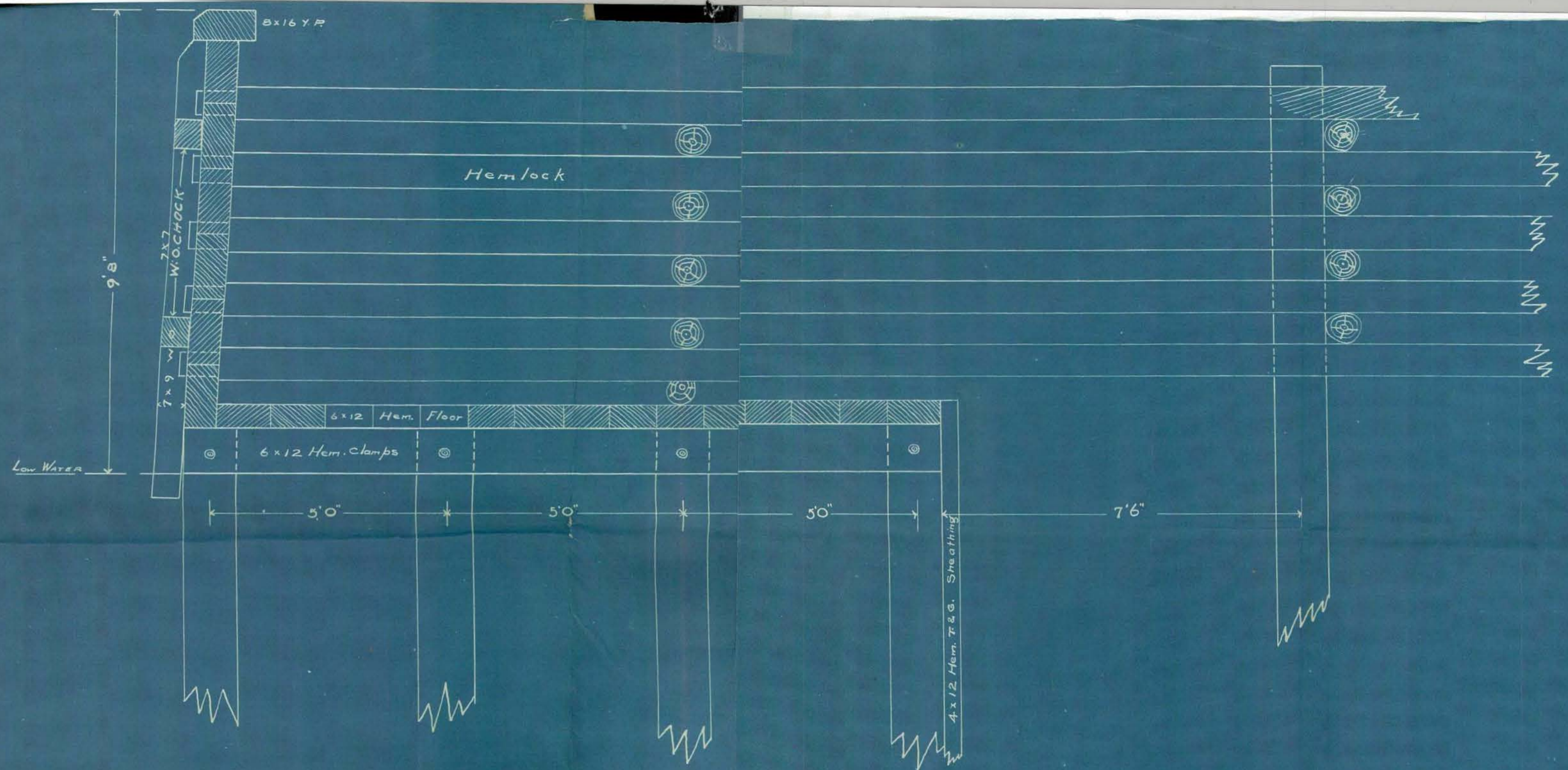
HOOPER & CO.
ARCHITECTS & ENGINEERS
NEWARK, N. J.
JOB 3044
SCALE 1/8" = 1'-0"
APPROVED May 13, 1916.

BULKHEAD SPECIFICATIONS



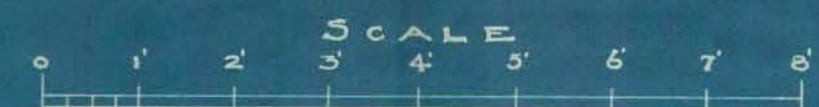
PLAN OF BULKHEAD
FOR
PATTON PAINT CO.
NEWARK, N. J.
scale-1"=4'

Ellis V. Thompson
Consulting Engineer



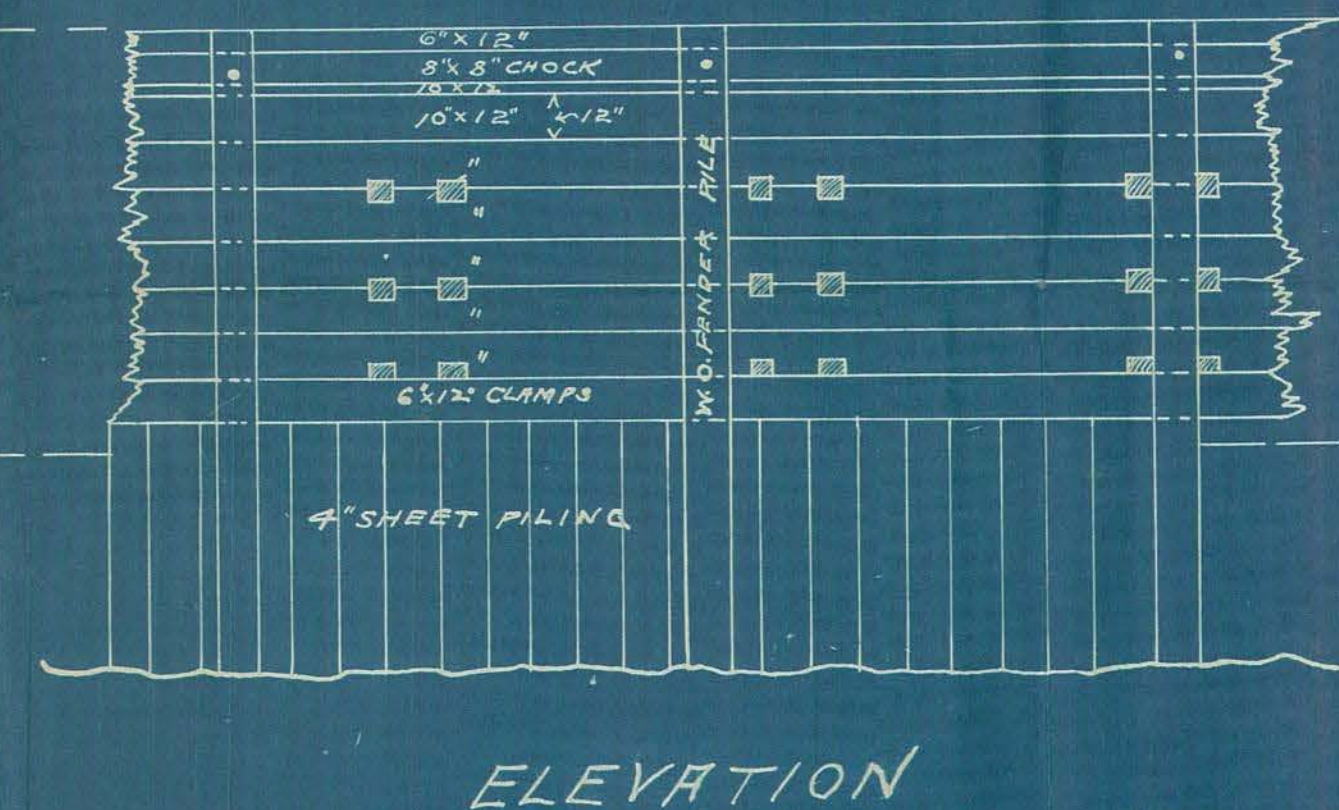
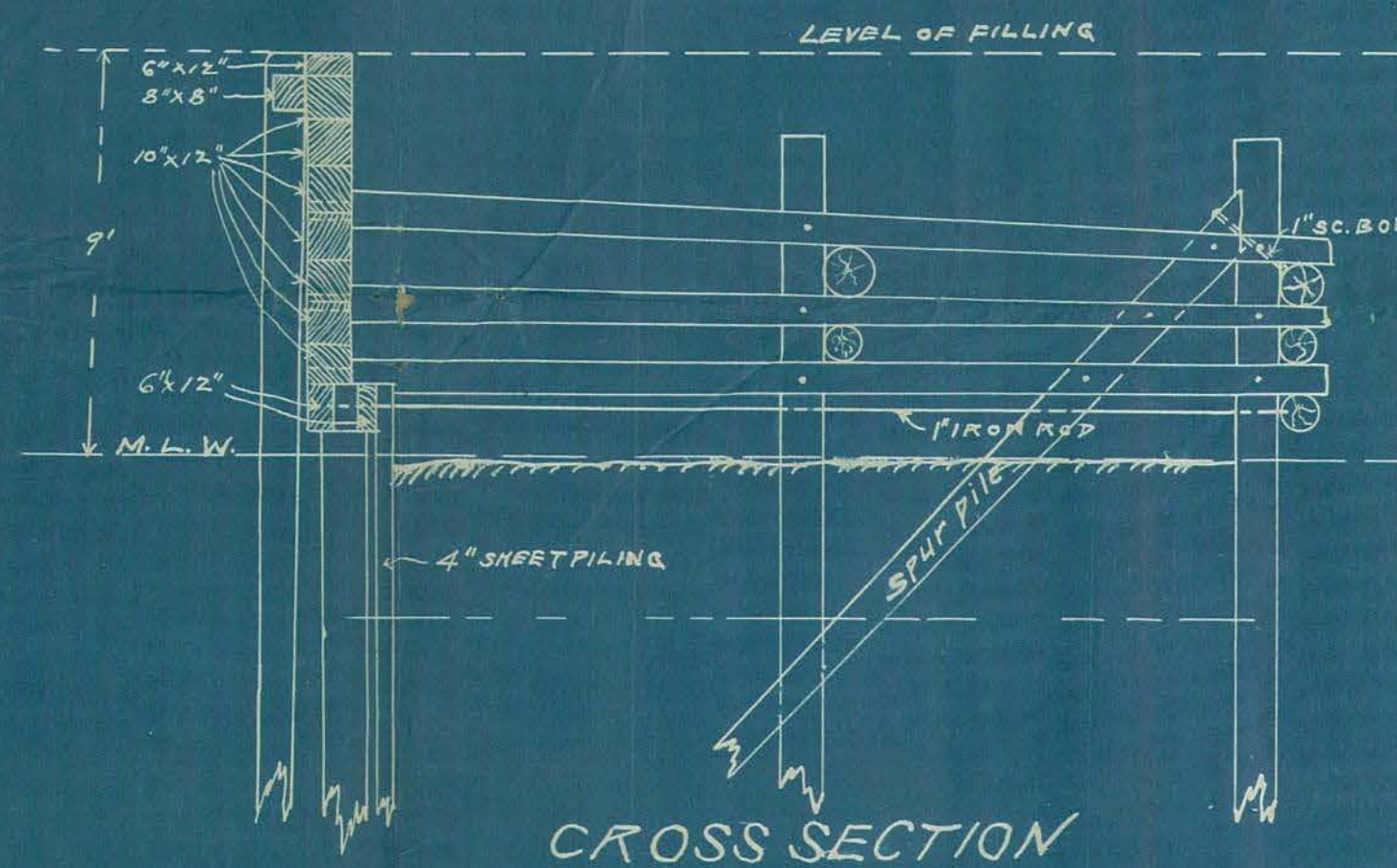
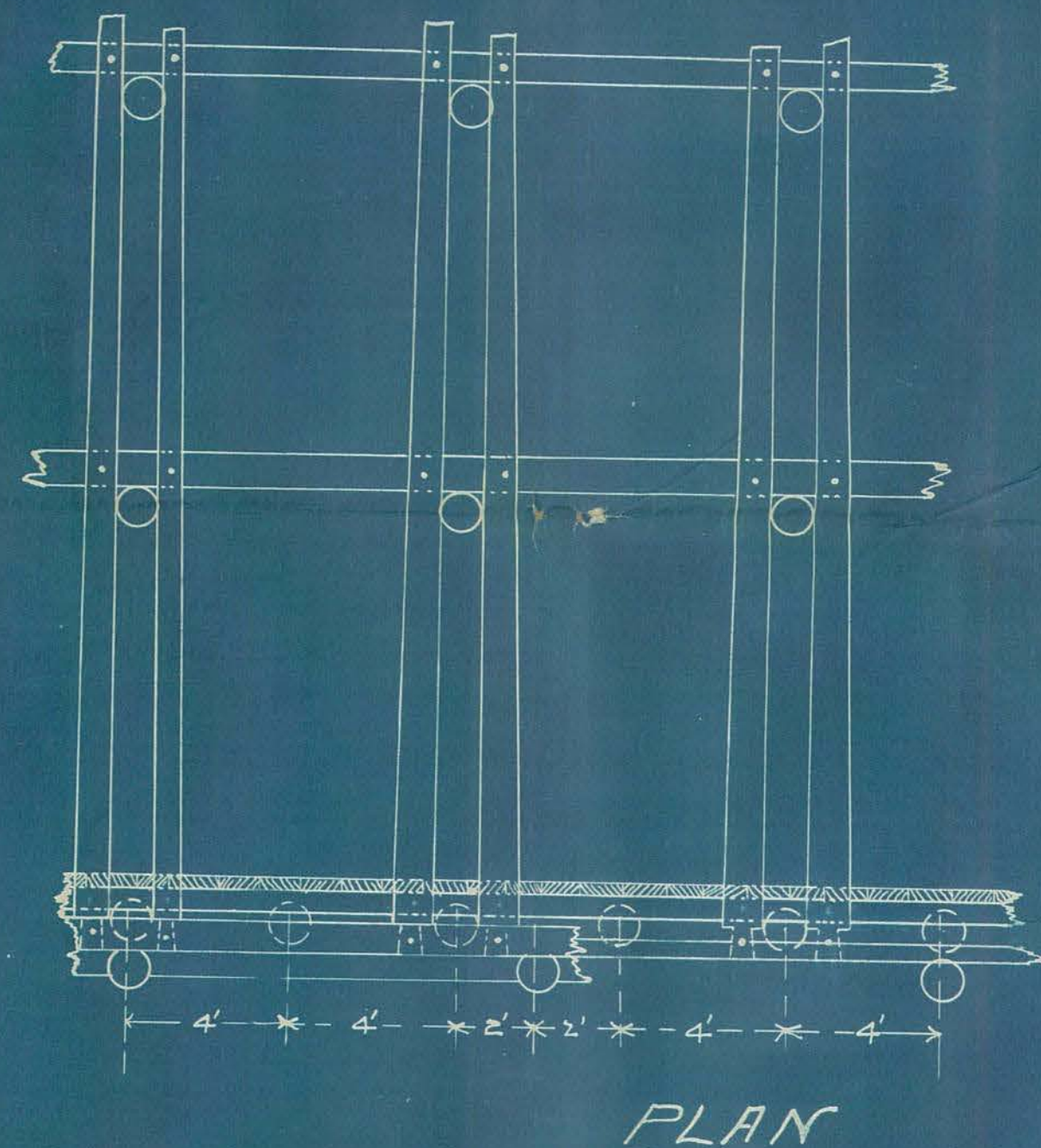
BULKHEAD SPECIFICATIONS

PLAN OF BULKHEAD
FOR
PATTON PAINT CO.
NEWARK N.J.



Ellis V. Thompson
Consulting Engineer

BULKHEAD SPECIFICATIONS



PLAN OF BULKHEAD
FOR
PATTON PAINT CO.
NEWARK, N. J.

scale-1"=4'

Ellis V. Thompson
Consulting Engineer

GENERAL

SPECIFICATIONS

— FOR —

BRICK VARNISH STACK,

ETC.

TO BE ERECTED FOR

THE PATTON PAINT COMPANY,

NEWARK, N. J.

Job No. 3 0 0 7.

HOOPER & CO.,

ARCHITECTS
AND

ENGINEERS,

118 MARKET STREET,

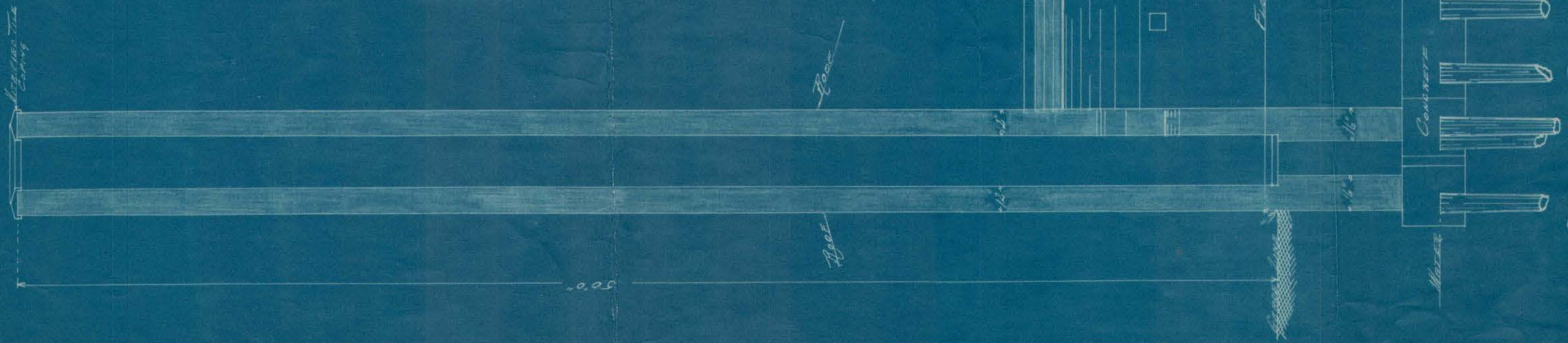
NEWARK, N. J.

PLUMBING SPECIFICATION.

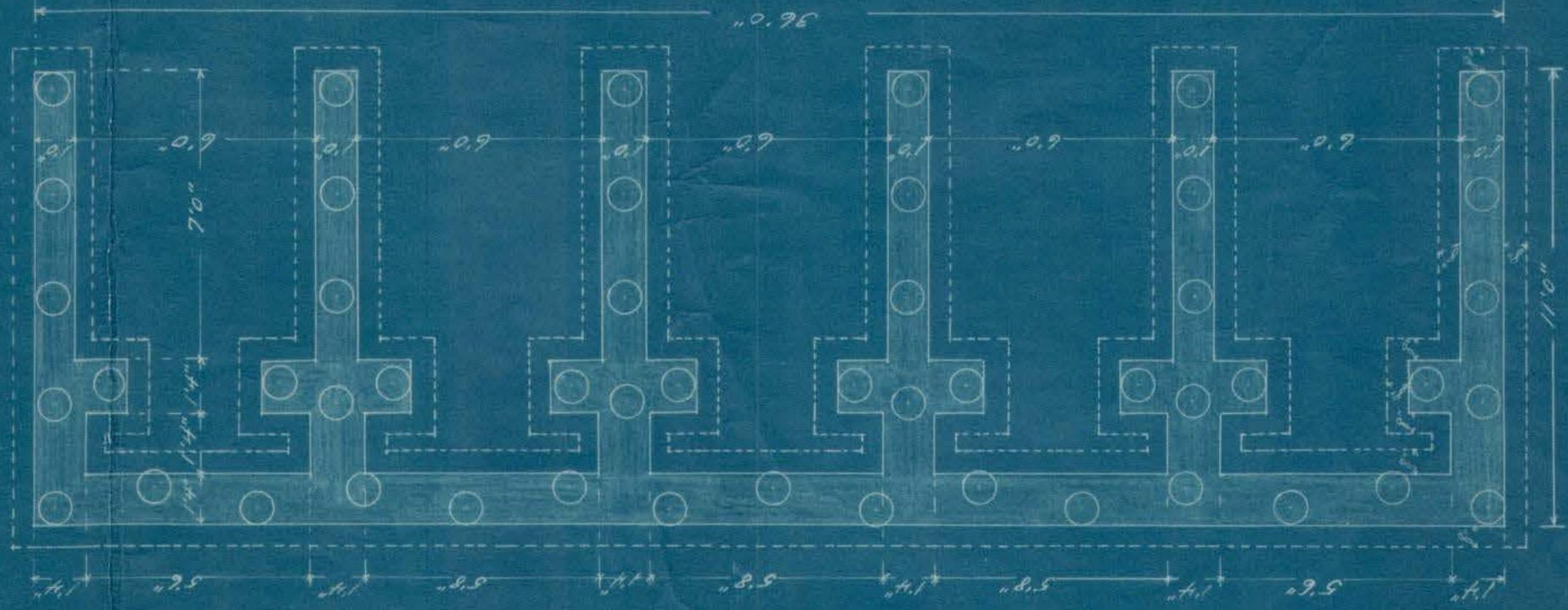
Connect a 3/4" galv. iron pipe with the water pipe in boiler house and run same 4' below grade to the new building, and then to the point designated on plans and finish three feet above floor with a 3/4" compression faucet with hose end.

Place a shut off 3' below grade with waste to be operated by a key from above to drain the upright pipe to prevent from freezing.

Run a 2" galv. iron waste pipe below grade from the cement sink in melting room to the river approximately 50'.

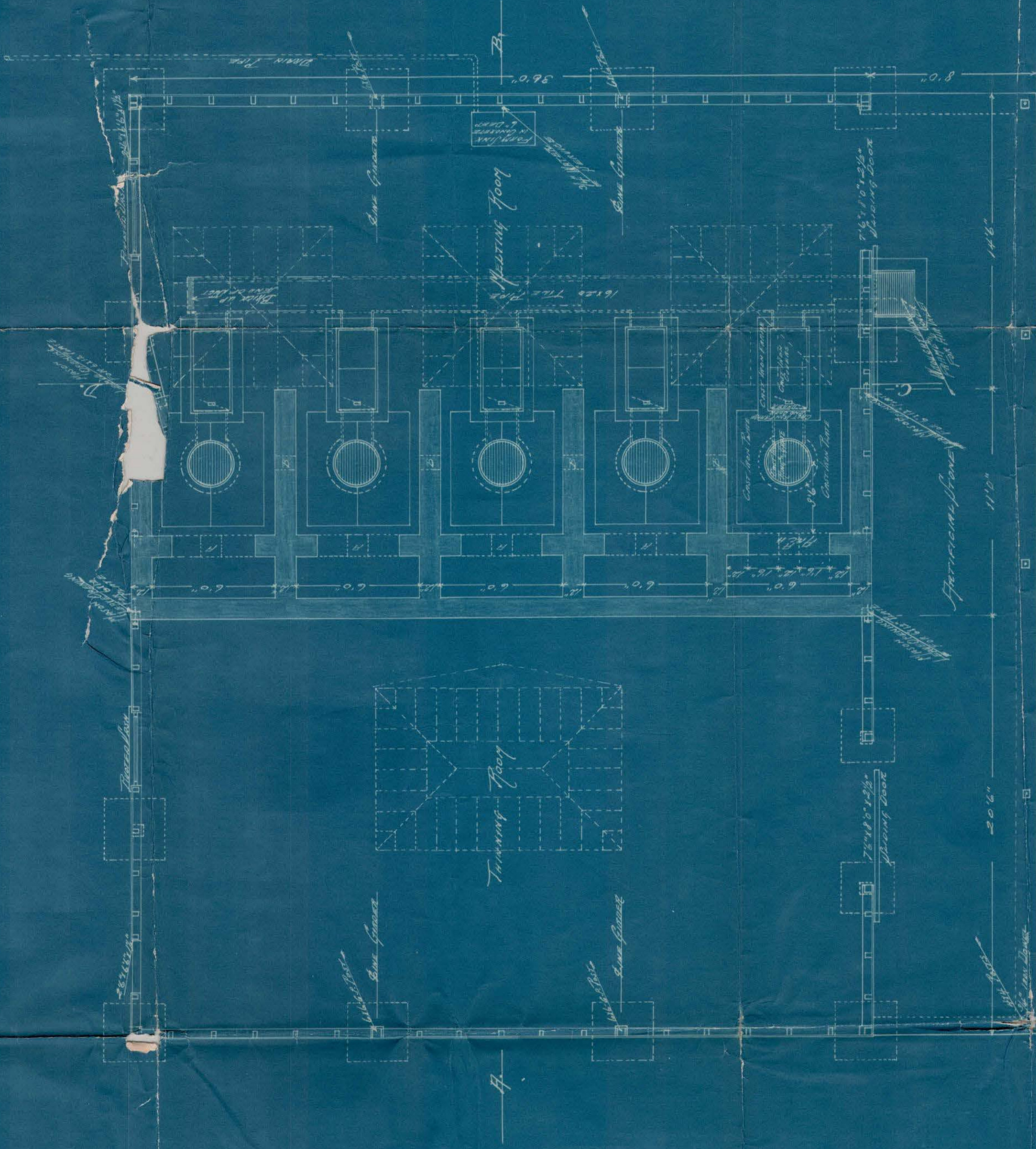


SECTION C-C

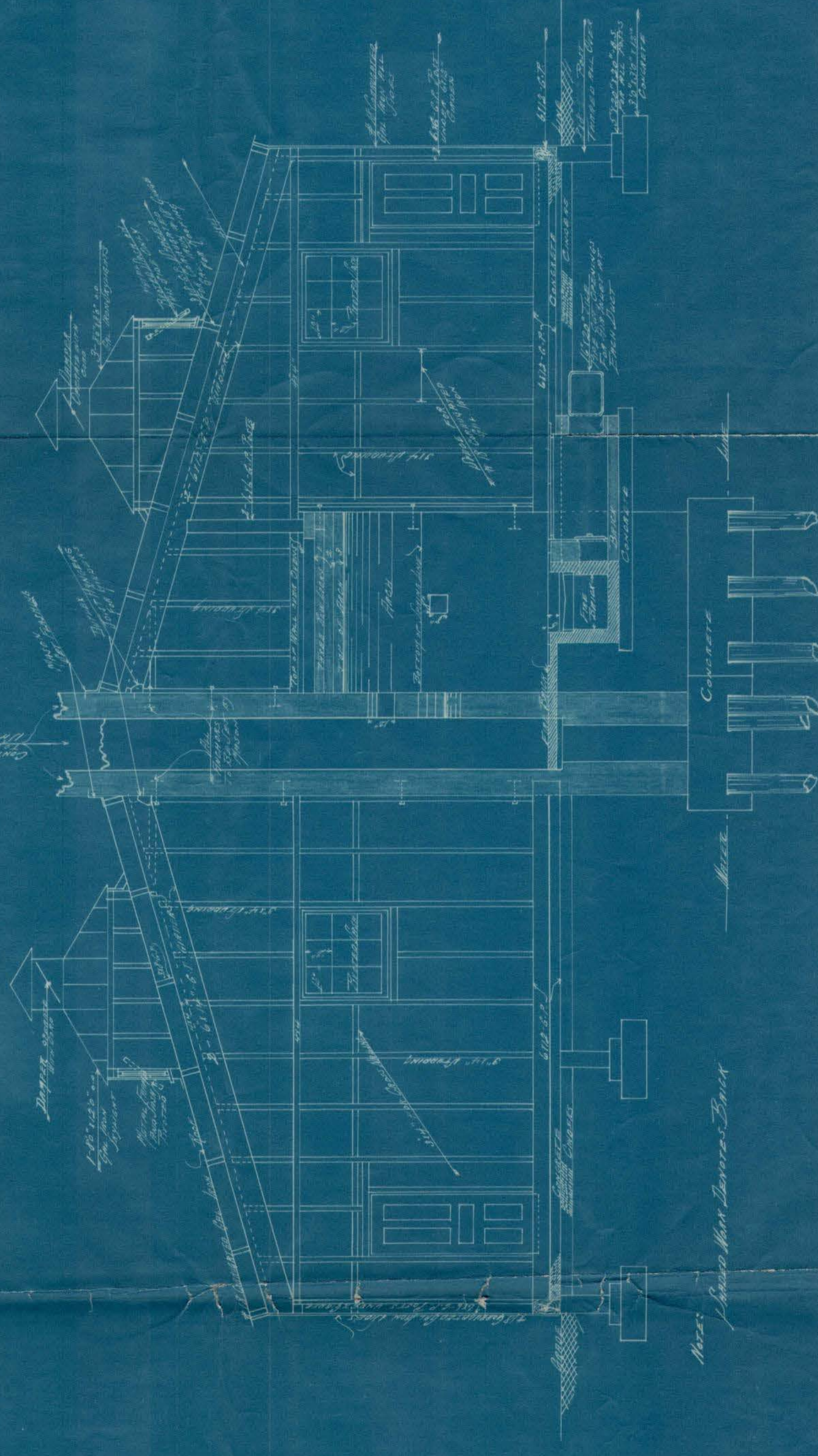


SECTION D-D

See Notes on General Conditions

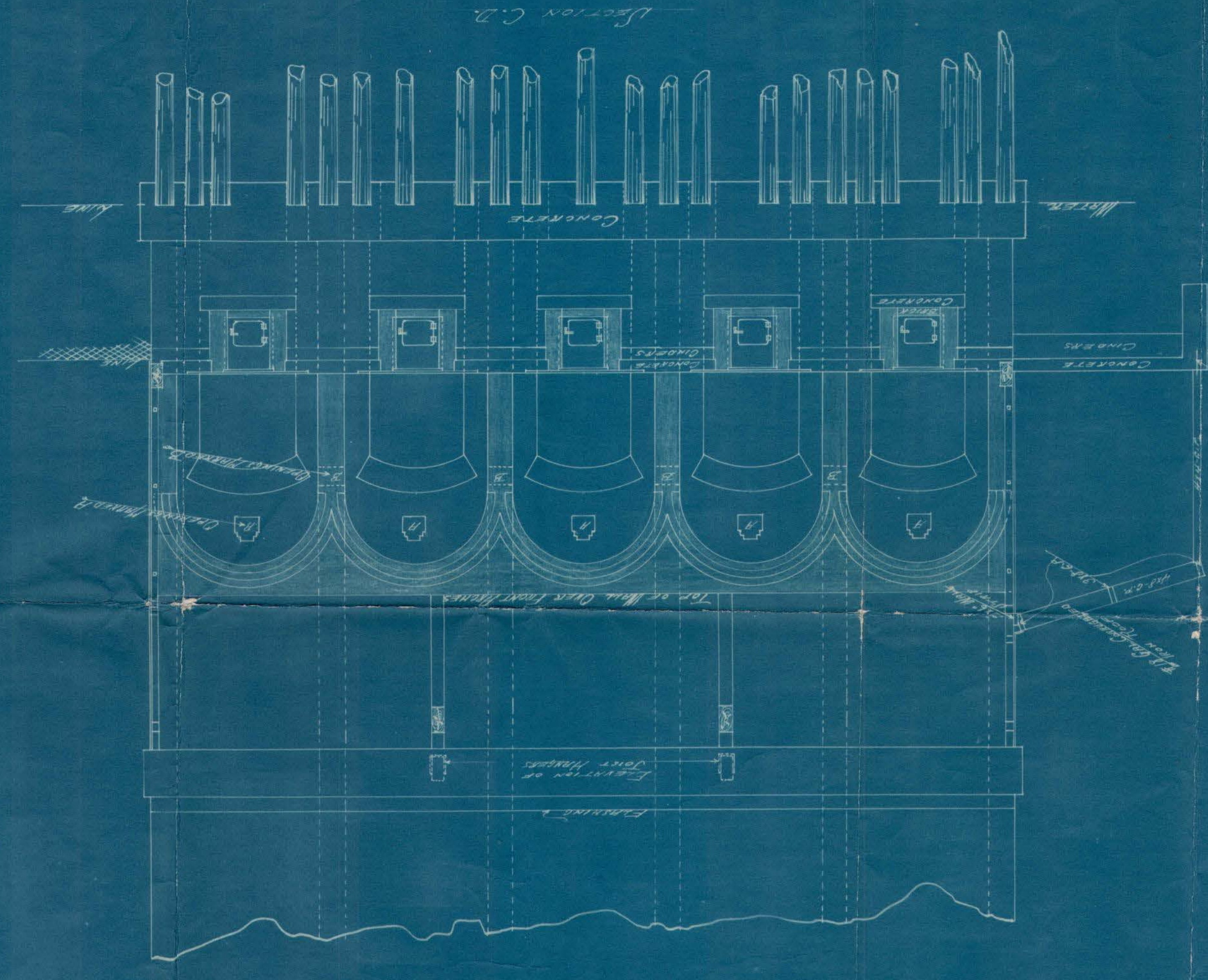


FLOOR PLAN



SECTION A-A

SECTION B-B



SECTION C-C

SECTION D-D

Varnish Stairs, Turnings & Spacing Beams
to be furnished by the Varnish Stair Co.
New York, N.Y.

HOOPER & CO.
ARCHITECTS & ENGINEERS,
NEWARK, N. J.
JOB 3007
SCALE 1/4" = 1'-0"
APPROVED: [Signature]

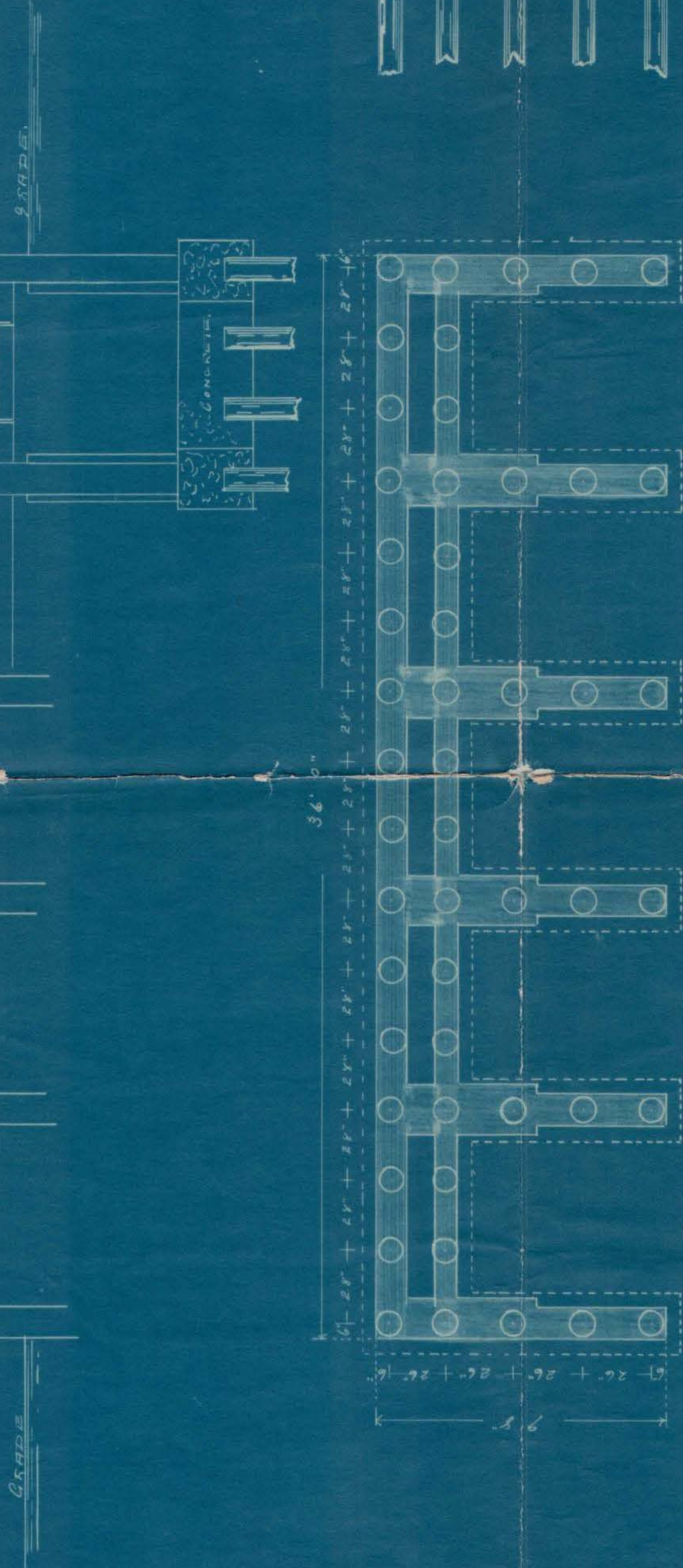
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George B. Jones.

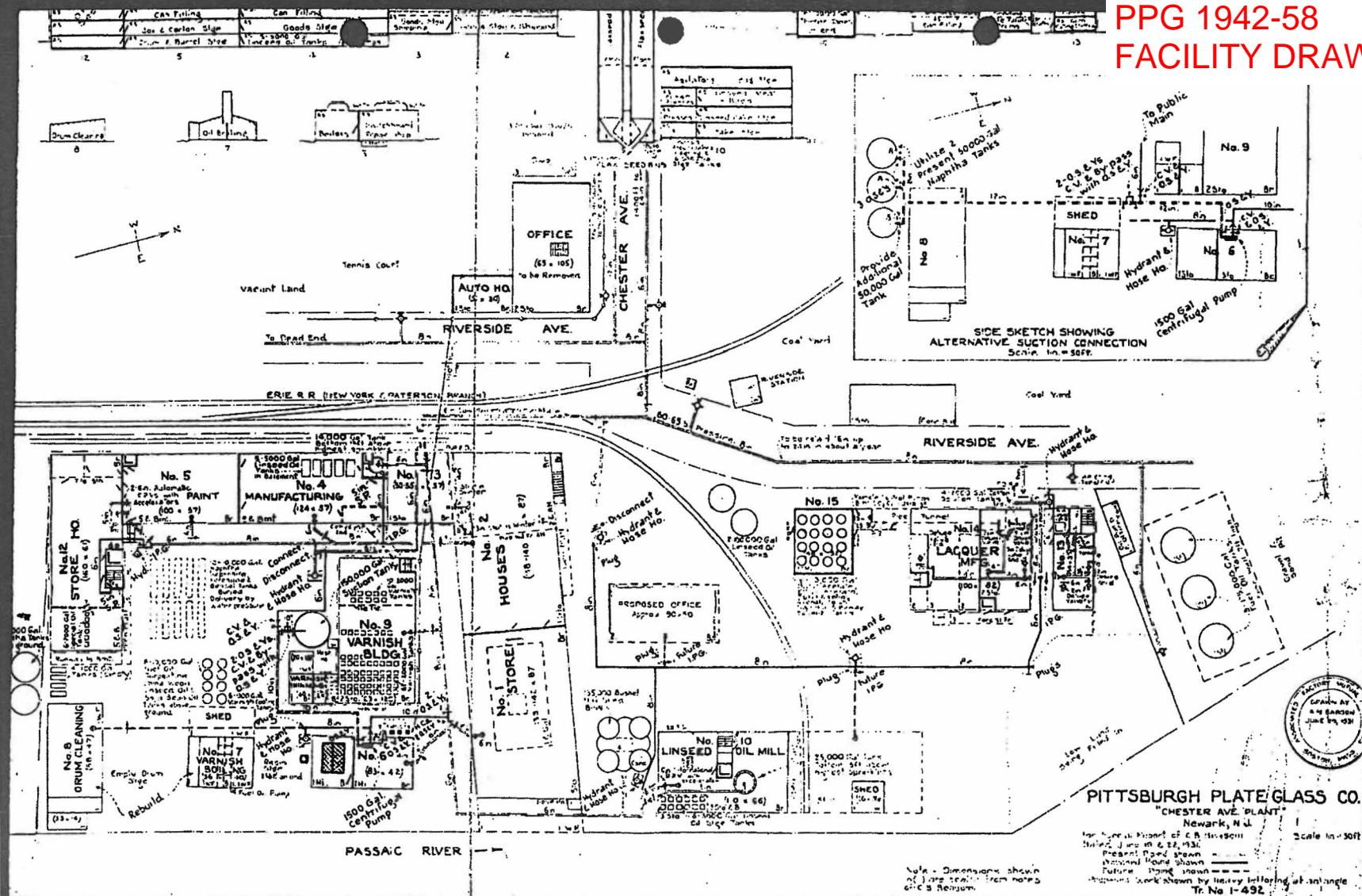


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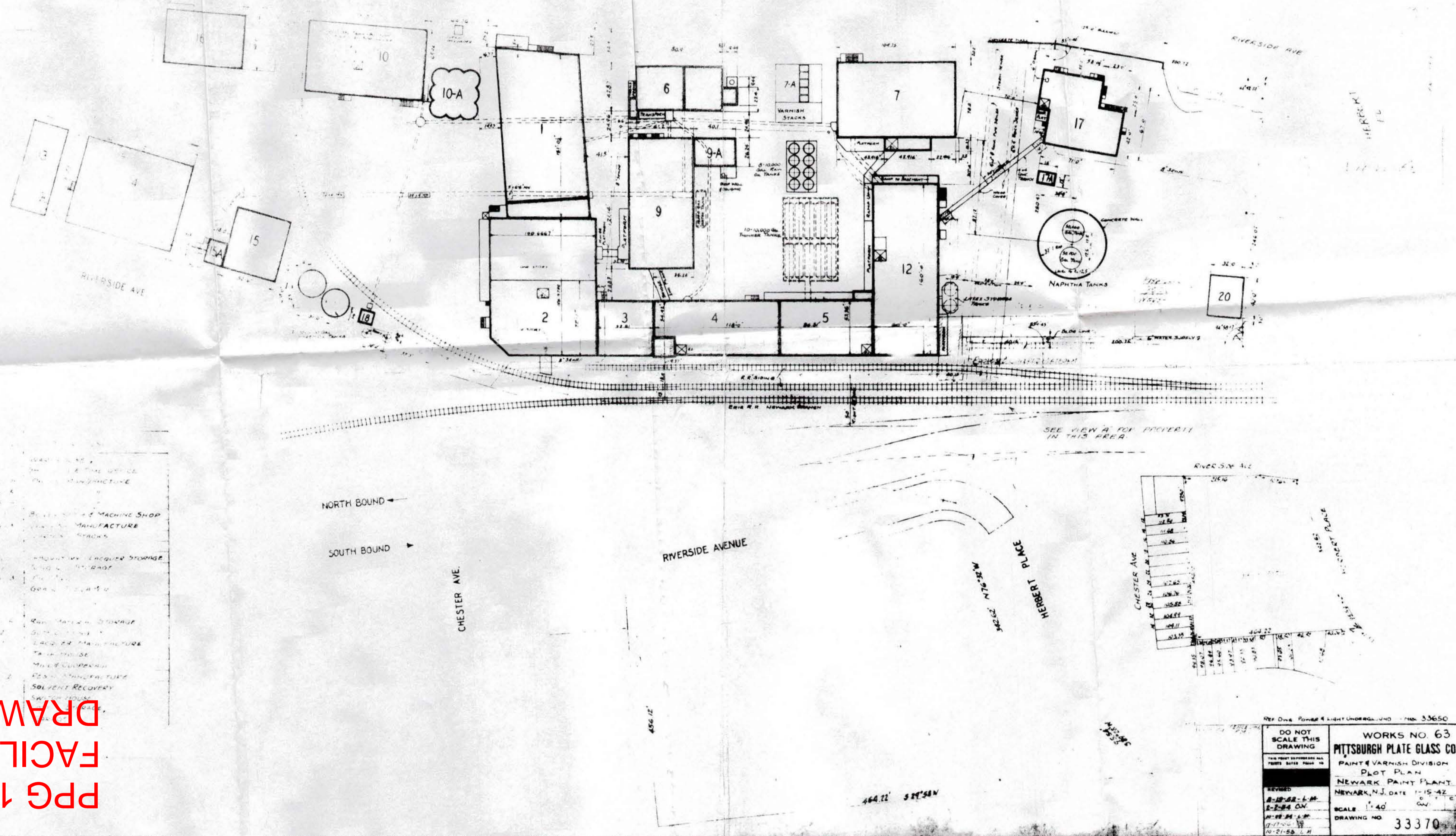


PPG 1942-58 FACILITY DRAWING



FILE OK 601-4

PPG 1942-58
FACILITY
DRAWING



APPENDIX D: 2011 USEPA/LOCKHEED MARTIN REPORT

TECHNICAL MEMORANDUM

SUPPLEMENTAL SURFACE SOIL, SEDIMENT, SEDIMENT POREWATER AND
GROUNDWATER SAMPLING – RIVERSIDE AVENUE SITE

NEWARK, NEW JERSEY
SEPTEMBER 2011

U.S. EPA Work Assignment No. 0-089
U.S. EPA Contract No. EP-C-04-032

Prepare by Lockheed Martin/SERAS

Prepared for the EPA/ERT

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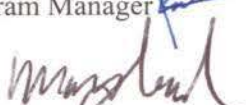


Lockheed Martin Technology Services
Environmental Services SERAS
2890 Woodbridge Avenue, Building 209 Annex
Edison, NJ 08837-3679
Telephone 732-321-4200 Facsimile 732-494-4021

DATE: September 8, 2011

TO: Donald T. Bussey, EPA/ERT Work Assignment Manager

THROUGH: Rick Leuser, SERAS Deputy Program Manager 

FROM: Martin Ebel, SERAS Task Leader 

SUBJECT: TECHNICAL MEMORANDUM – SUPPLEMENTAL SURFACE SOIL, SEDIMENT,
SEDIMENT POREWATER AND GROUNDWATER SAMPLING
29 RIVERSIDE AVENUE SITE, NEWARK, NEW JERSEY,
WORK ASSIGNMENT SERAS-089

INTRODUCTION

The United States Environmental Protection Agency (EPA) Region 2 requested the EPA - Environmental Response Team (ERT) to continue an investigation of a portion of the property located at 29 Riverside Avenue in Newark, New Jersey. Soil, sediment, sediment porewater and groundwater samples were collected by personnel from the Scientific, Engineering, Response and Analytical Services (SERAS) contract. This work supplemented a previous investigation at the site, conducted by SERAS in 2010.

The address 29 Riverside Avenue is divided into several facilities, many are operational; however, the subject properties of this investigation are not currently being used. The original 29 Riverside Avenue facility manufactured paint, stains, varnishes, and lacquers and stretched along the Passaic River both to the north and the south of the site. In 1984, the original property was subdivided into 15 lots. The study area for this investigation (the "Site") consists of two lots, (Lots 63 and 64 in Block 614) on the City of Newark's tax map and the soil, groundwater and structures located thereon. The Site is bordered to the north and south by other portions of the former facility being used by different companies. West of the site are railroad tracks and U. S. Route 21 (McCarter Highway), and to the east is the Passaic River (Figure 1). The Site encompasses two multistory buildings designated as Buildings 7 and 12. Building 7 contains 10 above ground storage tanks (ASTs) on the second floor, 85 ASTs on the third floor, and a subsurface impoundment beneath the building. Building 12 has two ASTs in the basement. Ten underground storage tanks (USTs) are located immediately to the north of building 12.

The purpose of this investigation was to:

- Confirm the results of previous sampling of the Building 7 basement impoundment,
- Determine contaminant releases to the Passaic River sediment from the site,

- Determine the hydraulic connectivity between the groundwater and the Passaic River by installing monitor wells and deploying pressure transducers into the wells, and
- Sample surface soil for polychlorinated biphenyls (PCBs) and dioxins to support the Passaic River Site investigation.

This investigation will further assess the release or threat of release of chemicals from the Site into the Passaic River beyond what was assessed in previous investigations. Previous studies have documented volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) and elevated concentrations of lead in site soil and groundwater.

BACKGROUND

Several environmental investigations have been conducted at the study area. Weston Solutions conducted a Preliminary Assessment for the owner of the Site (City of Newark). The Preliminary Assessment included a site history and a determination of areas-of-concern. The Birdsall Services Group business unit PMK Group (BSG/PMK) completed a site investigation for the Brick City Development Corporation – a business development entity run by the City of Newark. BSG/PMK collected soil and groundwater samples, as well as samples from the USTs and the impoundment beneath Building 7. Samples were analyzed for VOCs, SVOCs and metals. Their Site Investigation Report (Birdsall, 2009) reports the analytical results of their sampling and includes Weston's Preliminary Assessment Report as an appendix. BSG/PMK's analytical results indicated both VOCs and SVOCs exceed the New Jersey Department of Environmental Protection (NJDEP) cleanup criteria for both soil and groundwater. Although the individual tentatively identified compounds (TICs) were not identified, the total TIC concentrations were included and they were typically greater than 1,000 milligrams per kilograms (mg/kg). Lead had very high concentrations with respect to both the New Jersey soil and groundwater criteria. Several other metals also exceeded New Jersey criteria in soil and groundwater.

Tetra Tech EM Inc. (Tetra Tech) conducted a site removal assessment under the Superfund Technical Assessment and Response Team (START) contract for EPA Region 2. This assessment consisted of sampling containers, ASTs, a sump in Building 12, the impoundment beneath Building 7, potentially asbestos containing materials, and tar-like material from two locations (Tetra Tech, 2010a). Samples were analyzed for VOCs, SVOCs, pesticides, and PCBs. Building sediment and tar samples were also analyzed for the Target Analyte List (metals and cyanide) (TAL). An Addendum was prepared to address TICs found in the samples collected from the impoundment (Tetra Tech, 2010b).

Personnel on the SERAS contract continued the Removal Assessment of the site in 2010 (SERAS, 2010a). This investigation involved collecting subsurface soil samples and groundwater samples from temporary well points. In addition, near surface sediment samples were collected from the Passaic River. All samples were analyzed for Target Compound List (TCL) VOCs, SVOCs, and for TAL. Both filtered and unfiltered groundwater samples were collected for TAL analysis. SERAS personnel also prepared a Technical Memorandum documenting similarities between the analytical results available to date including results from BSG/PMK, Tetra Tech, and SERAS for TCL and TICs (SERAS, 2010b).

METHODOLOGY

Monitor Well Installation and Sampling

From February 24 to 28, 2011, a total of three monitor wells were installed north of Buildings 7 and 12. These wells were installed to determine the tidal influence on the site groundwater and confirm analytical results from the samples collected from temporary well points. Monitor wells, ERT1, ERT2 and ERT3

were installed by Jersey Boring and Drilling using an auger rig with six-inch hollow-stem augers (Figure 1). The wells are 20 feet deep and have 15 feet of polyvinyl chloride (PVC) 0.010-inch slotted screen and riser with a sand pack and completed with flush mounts. Because previous soil sampling included areas in the vicinity of the monitor wells, soil samples were not collected. The wells were developed immediately upon completion by the drilling subcontractor until the groundwater became clear. Once the wells were developed, pressure transducers were installed to record water levels. The transducers were installed to determine whether the groundwater on site is tidally influenced, and to substantiate the assertion that net groundwater flow is toward the Passaic River.

On April 12, 2011, the transducers were removed and the wells were sampled using peristaltic pumps. Three well volumes were removed and groundwater samples were collected for VOC and SVOC analyses.

Surficial Soil Sampling

On April 12, 2011, 11 surface soil samples (NS-1 through NS-11) and a duplicate NS-7D were collected from the north side of the Site (Figure 2). Samples were collected from the top inch of soil, homogenized, and placed in sample jars. Soil sample locations were selected based on historical information and observations at the Site. The samples were analyzed for PCBs and Dioxin.

Sediment Sampling

The sediment samples collected during the previous SERAS investigation were excavated from depths of 0.2 to 0.7 feet from the Passaic River mudflat adjacent to the site. Analytical results for VOCs only detected one TIC at a very low concentration, most likely due to the loss of VOCs from repeated exposure to the atmosphere. During this investigation, deeper sediments were sampled, because they are not directly exposed to the atmosphere, and porewater samples were collected to determine if contaminants in the groundwater were being discharged into the river.

On April 13 to 14, 2011, 12 sediment and 10 porewater samples including duplicates were collected from the Passaic River adjacent to the site. Sediment samples SED2 through SED10, and SED6-7, SED7-8 and its duplicate, SED7-8D, were collected between a City of Newark storm water discharge outlet south of Building 7 to approximately 160 feet upriver (North) from the site (Figure 3). The location for proposed sample SED1 was inaccessible and porewater from SED3 and SED4 could not be collected as the holes did not accumulate porewater. The samples were collected at low tide by removing the top one to two feet of material and hand auguring six inches into the exposed subsurface sediment. The excavation created during the sediment sampling was allowed to fill with porewater, while ensuring surface water did not enter the excavation. The sediment was sampled for VOC analysis, then homogenized and sampled for SVOCs and lead. The unfiltered porewater was collected in sample containers for VOCs, SVOCs, and lead analyses using a peristaltic pump.

Impoundment Under Building 7

The impoundment under Building 7 was reportedly used for discharging contaminated waste water. The dimensions and whether the impoundment is compartmentalized are unknown. There are four openings that provide access to the impoundment from which samples could be collected. The water level in the impoundment was approximately two feet below the floor, and a water sample was collected at all four openings and denoted as B7-1 through B7-4 (Figure 1). Sediment was collected from location B7-1, but could not be collected from B7-2 and B7-4 due to the presence of plastic debris covering any sediment, and there was no sediment found at B7-3.

Underground Storage Tank Delineation

The ten 12,000-gallon USTs previously sampled by BSG/PMK were reported to be north of Building 12. On May 5, 2011, the location of the USTs was marked in the field using ground penetrating radar (GPR). The reported locations of the USTs are illustrated on Figure 1, which is consistent with the field-marked locations. The GPR transmits a 250 megahertz radio wave into the ground and records the reflected waves. The characteristic reflections from USTs were interpreted to delineate the boundaries of the USTs (Figure 1). The corners of the UST area and ends of each UST pair (aligned east-west) were marked by driving metal spikes with flagging into the ground. These points were also field-marked with paint.

Sample Analyses

Soil, sediment, sediment porewater, groundwater and Building 7 impoundment samples were collected by personnel from the SERAS contract. Samples collected for dioxin analysis were submitted to Cape Fear Analytical in Wilmington, North Carolina. The dioxin data are included as Appendix A. Samples collected for TCL VOCs, SVOCs, PCBs, and lead were submitted to the EPA Region 2 Division of Environmental Science and Assessment (DESA) laboratory in Edison, New Jersey. The analytical results for the DESA laboratory are included as Appendix B. All samples were cooled to 4 degrees Celsius (°C) and submitted to the laboratories under chain-of-custody.

RESULTS

Surface Soil (Dioxin and PCBs)

Surficial soil samples were collected from various locations throughout the open area on the northern side of the site (Figure 2). One sample was collected from the top of a soil pile near the western boundary of the Site, and two soil samples were collected along the bank of the Passaic River. All soil samples contained most or all of the compounds included in the dioxin analyses. Aroclor 1254 was the only component of the PCB analyses that was present.

Dioxins are assessed by their Toxicity Equivalence (TEQ), which is the sum of a weighted average calculated by multiplying the concentration of each compound by its relative toxicity. The TEQ was developed by the World Health Organization, and the EPA has proposed 950 parts per trillion or picograms/gram (pg/g) as the non-residential soil cleanup criteria, which is well above the highest TEQ value of 235 pg/g found in the surface soil collected (Table 1).

The PCB analyses indicate that one soil sample exceeded the NJDEP Non-residential Direct Contact Soil Cleanup Criteria (NRDCSCC) of 2 mg/kg. Sample NS-1, collected from the top of the soil pile, contained 3 mg/kg of Aroclor 1254 (Table 2). These results, along with the dioxin results, are provided on Figure 2.

Groundwater (VOCs and SVOCs)

The four groundwater samples collected from the installed wells contained numerous VOCs and several SVOCs. Many of these are TICs. Of the VOCs identified in the groundwater, six have listed NJDEP Specific Ground Water Quality Criteria (SGWQC), of which two exceeded their criteria. All four samples contained benzene, ranging from 24 to 40 µg/L. Therefore, all four groundwater samples collected had benzene at a concentration which exceeded the SGWQC of 1 microgram per liter (µg/L). One groundwater sample contained methylene chloride at a concentration of 230 µg/L which is in excess of the SGWQC of 3 µg/L. VOC results are provided on Table 3, and illustrated on Figure 3.

The only detected SVOC that has a NJDEP listed SGWQC is naphthalene. The SGWQC is 300 µg/L and the concentration of naphthalene in sample ERT-3 is 22 µg/L. The SVOC results are provided on Table 4, and shown on Figure 3.

Sediment and Sediment Porewater (VOCs, SVOCs, and Lead)

Twelve sediment and ten unfiltered porewater samples were collected from the Passaic River immediately adjacent to the Site. Chemical odor and sheen were noted at most of the locations. Locations with weak chemical odors and slight to no sheens include SED2 through SED5, SED9, and SED10. The sediment at SED6, SED6-7, SED7, and SED7-8 had strong chemical odors and significant sheens that flowed out from the sampling location and across the mudflat. The photographs (1 through 6) in Appendix C show these significant sheens.

Analyses of lead from sediment were compared to the NRDCSCC, which is 600 mg/kg (Table 5). All of the sediment samples, except SED10, contained lead concentrations exceeding the criteria with the highest concentration of 940 mg/kg identified at SED9. Lead concentrations in the porewater were compared to the SGWQC of 5 µg/L (Table 5). All ten samples contained lead exceeding the criteria with concentrations ranging from 86 to 1,100 µg/L. The analytical results are provided on Figure 4.

Analyses of VOCs and SVOCs from the sediment were compared to the NRDCSCC and the NJDEP Impact to Groundwater (IGW) soil cleanup criteria. VOCs, ranging from as few as 4 compounds (SED10) to as many as 20 (SED8), were identified in all 12 sediment samples. Many of these VOCs are TICs (Table 6). Of the nine detected VOCs that have listed criteria, none of the samples had concentrations that exceeded criteria. When comparing the analyte concentrations found in the sediment against the values found in the Ecological Screening Criteria Table used for performing a Baseline Ecological Evaluation, 4 samples contain VOCs and 10 samples contain SVOCs that exceed the guideline.

Most sediment samples contained only one SVOC, bis (2-ethylhexyl) phthalate, two samples had no SVOCs, and SED7 and SED8 had multiple SVOCs (Table 7). Thirteen of the SVOCs that were detected had criteria, sample SED7 had two and SED8 had five SVOCs with concentrations exceeding criteria. Most of the SVOCs detected in samples SED7 and SED8, including all those exceeding criteria, are polycyclic aromatic hydrocarbons (PAHs). These results are provided on Figure 5.

Analyses of VOCs and SVOCs from the sediment porewater were compared to the SGWQC. All 10 sediment porewater samples contained up to 12 VOCs, with many of these being TICs (Table 8). Four of the detected VOCs have listed criteria with two being exceeded. SED6-7, SED8 and SED9 exceeded the criteria of 1 µg/L for benzene with concentrations of 6.2, 41 and 7.1 µg/L, and SED8 exceeded the criteria of 10 µg/L for tetrahydrofuran with a concentration of 14 µg/L.

All of the porewater samples contained SVOCs with up to 17 compounds (Table 9). Samples SED6-7 and SED9 exceeded the criteria of 30 µg/L for the SVOCs bis (2-ethylhexyl) phthalate with 30 and 52 µg/L, respectively. SED7-8D exceeded the criteria for six PAHs. These results are provided on Figure 6.

Building 7 Impoundment (VOCs and SVOCs)

One sediment sample collected from Building 7 at location B7-1 was analyzed for VOCs and SVOCs. Thirty-six VOCs were detected in B7-1, most of which had NRDCSCC and IGW criteria. However, only the IGW criteria for benzene (1,000 µg/kg) was exceeded at a concentration of 1,400 µg/L (Table 10).

Twenty-five SVOCs were detected, ten of which have NRDCSCC and IGW criteria; most of these are PAHs (Table 11). These results are provided on Figure 7.

The four water samples collected from Building 7 at location B7-1 through B7-4 were analyzed for VOCs and SVOCs. Numerous VOCs (Table 12) and SVOCs (Table 13) were detected, 18 VOCs and 3 SVOC had SGWQC. Ten of the VOCs and two of the SVOCs exceeded the criteria. These results are also provided on Figure 8.

Groundwater Flow

The data from the transducers in the three wells shows that all three wells are tidally influenced. Water levels in the downgradient well (ERT3) had a tidal range of as small as 0.6 feet and as large as 2.6 feet during the recording period (Figure 9). The smaller range followed heavy rain (Figure 9). Water levels in ERT2, near the center of the site, had a relatively consistent tidal range of approximately 0.2 feet superimposed on a longer period trend. For most of the recording period, the upgradient well (ERT1) shows a step pattern with pauses in the rise or fall of the water level matching the phase of the tidal cycle. There was a notable exception to this; immediately following the three heaviest rainfalls, the water level in ERT1 drops to a lower level with a much lower low tide level. The drop in the third event is over a foot.

The data was smoothed using a 48-hour moving average following the procedure by Serfes (1991) to remove the tidal effect (Figure 10). Between March 9 and 16, the Passaic River was higher due to heavy rainfall and snow melt. During this period, the groundwater level nearer to the river was higher than farther away. Smaller rises in the groundwater near the river follows each rainfall in the area. Water levels in the two other wells follow the same trend with the water levels in ERT2 and ERT3 rising above the groundwater elevation in ERT1 following rain the falling back below it again as the effect of the rain tapers off. The water levels in ERT1 and ERT3 are synchronous with each other while ERT2 tends to lead the other two.

When river levels increase and the groundwater elevation at ERT3 begins rising, a subtle groundwater divide develops and migrates westward across the site. Eventually, if the river is high enough, the divide migrates west of ERT1 and temporarily, the net flow is from the river to the site. As the river level drops, the divides migrates eastward, and the net flow is toward the river. This effect is most notable between March 6 and 9 for the westward migrating divide, and March 16 to 19 for the eastward migration. During the recording period, the average water table slopes toward the Passaic River.

DISCUSSION

A comparison was made between analytes detected in this investigation and the previous investigations conducted at the Site. The previous investigations include those done by BSG/PMK, Tetra Tech and SERAS. Tables 14 and 15 show the analytes that were detected in this investigation as well as those in the previous investigations. TICs were only available for the UST data from the BSG/PMK investigation, so no TICs are indicated in the last three columns of Tables 14 and 15.

The comparison of analytical results between the different investigations and the respective media was made for investigations conducted at the Site. Table 14 lists 201 VOCs, and Table 15 lists 304 SVOCs that were detected. The various investigations used different laboratories, which can have several effects on the list. Different laboratories may be using different naming conventions for the same analyte. Different laboratories and even different gas chromatographs/mass spectrometers (GC/MS) at the same laboratories may be using different software to identify TICs. The various software also has varying

character limits truncating the names at different lengths. Since the analytical procedure for SVOC analysis does not preclude VOCs from being detected in the same sample, many of the TICs reported for the SVOCs are VOCs.

Most TICs do not have regulatory criteria. A few TICs do have criteria, for example diisopropyl ether, tetrahydrofuran and 4-chloroaniline, and others such as tetrabutylstannane (a tin compound) are known to be highly toxic to aquatic organisms.

The analytical results from the samples collected during this investigation continue to indicate that many chemicals and chemical compounds were released and commingled in the soil and the groundwater at the Site. Numerous VOCs and SVOCs occur on the Site, most of which are not on the TCL and are identified as TICs. Nearly all of the TICs and many of the TCL compounds do not have a regulatory criteria assigned by the NJDEP.

VOCs were analyzed in samples collected from groundwater, sediment, porewater, impoundment water and impoundment sediment. Numerous VOCs were detected and summarized in Table 14 with analytical results from the other investigations. Many of these are atypical at sites contaminated with VOCs. Two of these atypical compounds have uses in coatings. These are diisopropyl ether used in paint thinner and tetrahydrofuran used as a solvent in varnishes.

One common VOC that is found at the Site in all media that were sampled is benzene. Benzene may have been used in the manufacturing of various products at the Site. There are two isolated areas where benzene was detected in soil; one area is to the north of Building 7, and the second is southeast portion of Building 7. A total of 15 groundwater samples were collected during the two investigations by SERAS. Benzene was not found in the groundwater sample collected farthest hydraulically upgradient suggesting dissolved phase benzene is not migrating in groundwater from the upgradient direction onto the Site. All groundwater samples collected from the sample locations north and southeast of Building 7 contained benzene. In addition, groundwater samples collected hydraulically downgradient of the northern potential source area also contained benzene suggesting the dissolved phase is mobile. Porewater samples collected from the Passaic River mudflat and adjacent to Building 7 also contained benzene suggesting the shallow groundwater is seeping into the Passaic River.

SVOCs were analyzed in samples collected from groundwater, sediment, sediment porewater, summarized in Table 15 along with the SVOCs detected in the other investigations.

Lead was analyzed in the sediment and porewater in this investigation and soil, groundwater, and sediment in the previous SERAS investigation. Results from these investigations detected lead in elevated concentrations, mostly above criteria, throughout the site in all media.

The sediment samples from this investigation were collected from a deeper interval than the previous SERAS investigation. Analytic results from this investigation contained abundant VOCs (mostly TICs) that were largely absent from the shallower sediment samples. The pore water samples contained a large number of VOCs and SVOCs that were not detected in either the surficial or subsurface sediment suggesting these pore fluids may represent seepage or underflow of site groundwater.

Various chemicals have been released at the site and are interacting between the various media. There exist enough common compounds in the various media at the Site to suggest this interaction. Chemical compounds may be migrating within the groundwater at the Site itself possibly migrating off-Site.

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- SERAS. *Trip Report – Soil, Sediment, And Groundwater Sampling, 29 Riverside Avenue Site, Newark, New Jersey,* October, 2010a
- SERAS. *Technical Memorandum – Tentatively Identified Compounds In Underground Storage Tanks And Environmental Samples, 29 Riverside Avenue Site, Newark, New Jersey,* November, 2010b
- Serfes, Michael E. *Determining the Mean Hydraulic Gradient of Ground Water Affected By Tidal Fluctuations.* Ground Water Volume 29. Pp. 549 – 555.
- Tetra Tech EM Inc. *Revised Draft Trip Report for the Riverside Avenue Site, Riverside Avenue, Newark, Essex County, New Jersey.* September, 2010a
- Tetra Tech EM Inc. *Technical Memorandum– Addendum To Final Trip Report Tentatively Identified Compounds Detected In Aqueous And Sediment Samples Riverside Avenue Site, Newark, NJ.* December, 2010b

TABLES

TABLE 1
Dioxin in Soil
Riverside Avenue Site
Newark, New Jersey

Sample Location	Dioxin Concentration (TEQ WHO2005)
	pg/g
NS-1	36.1
NS-2	16.2
NS-3	55.5
NS-4	3.57
NS-5	4.06
NS-6	4.89
NS-7	11.6
NS-7D	9.55
NS-8	107
NS-9	23.6
NS-10	147
NS-11	235

pg/g = picograms per gram

The EPA has proposed a cleanup criteria of 950 pg/g

*Dioxin concentrations are presented as the toxic equivalents (TEQs), which is used to report the toxicity-weighted masses of mixture of dioxins. The TEQs values are calculated based on WHO 2005 TEF.

TABLE 2
Aroclors in Soil
Riverside Avenue Site
Newark, New Jersey

Sample Location	Concentration	
	Aroclors	(µg/kg)
NS-1	1254	3,000
NS-2	1254	230
NS-3	1254	630
NS-4	1254	81
NS-5	1254	55
NS-6	1254	82
NS-7	1254	U
NS-7D	1254	U
NS-8	1254	U
NS-9	1254	400
NS-10	1254	120
NS-11	1254	160

U = The analyte was not detected at or above the Reporting Limit.

NJDEP NRDCSCC = 2,000 µg/kg

NJDEP IGWSCC = 50,000 µg/kg (unfiltered)

Bold = above criteria

TABLE 3
Volatile Organic Compounds in Groundwater
Riverside Avenue Site
Newark, New Jersey

Analyte	Concentration (µg/L)			
	ERT-1	ERT-2	ERT-2D	ERT-3
Methylene Chloride (3)	230	U	U	U
Cyclohexane	24	26	27	8.9
Benzene (1)	24	40	40	33
Methylcyclohexane	87	150	150	57
4-Methyl-2-Pentanone	U	17	17	U
Ethylbenzene (700)	U	7.5	7.9	19
M/P-Xylene (1000 Total Xylenes)	7.6	7.9	8.1	11
O-Xylene (1000 Total Xylenes)	5.2	6.8	7.0	U
Isopropylbenzene	36	170	170	38
1-Buten-3-yne, 2-Methyl	120 NJ	U	U	U
Diisopropyl Ether (20,000)	700 NJ	630 NJ	620 NJ	77 NJ
Chlorobenzene (50)	U	U	U	9.3
Benzene, 1-Methyl-2-Propyl	U	U	73 NJ	U
Benzene, (1-Methylpropyl)	34 NJ	72 NJ	U	U
Benzene, Propyl	U	150 NJ	150 NJ	U
4,7-Methano-1H-Indene	610 NJ	320 NJ	320 NJ	U
Indane	120 NJ	210 NJ	210 NJ	130 NJ
Benzene, 1,3-Diethyl	45 NJ	U	U	57 NJ
1-Phenyl-1-Butene	38 NJ	U	U	U
Benzene, 1-Ethyl-3,5-Dimethyl	U	U	77 NJ	U
Benzene, 1-Ethenyl-3-Ethyl	U	U	U	80 NJ
Benzene, 1-Ethenyl-4-Ethyl	U	100 NJ	U	U
Benzene, 1-Methyl-2-(1-Methyl)	U	U	U	250/48 DNJ
Benzene, 2-Ethyl-1,3-Dimethyl	58 NJ	U	U	U
Benzene, 1,2,3,4-Tetramethyl	U	76 NJ	U	150 NJ
Benzene, 2-ethyl-1,4-Dimethyl	47 NJ	120 NJ	120 NJ	U
Benzene, 1,2,4,5-Tetramethyl	U	91 NJ	91 NJ	200 NJ
Indan, 1-Methyl	84 NJ	U	100 NJ	U
1H-Indene, 2,3-Dihydro-4-Methyl	U	U	72 NJ	160 NJ
1H-Indene, 2,3-Dihydro-5-Methyl	U	71 NJ	U	76 NJ

U = The analyte was not detected at or above the Reporting Limit.

NJ = There is presumptive evidence that the analyte is present; the analyte is reported as a tentative identification. The reported value is an estimate.

D = Two concentrations were reported for this analyte.

(3) = (SGWQC)

Bold = above criteria

TABLE 4
Semivolatile Organic Compounds in Groundwater
Riverside Avenue Site
Newark, New Jersey

Analyte	Concentration (µg/L)			
	ERT-1	ERT-2	ERT-2D	ERT-3
4-Methylphenol	U	U	U	8.6 L
Naphthalene (300)	U	U	U	22
Cyclohexanone, 3,3,5-trimethyl	U	U	U	33 NJ
Cyclohexanamine, N-methyl	190 NJ	U	U	U
Cyclohexanamine, N,N-methyl	110 NJ	U	U	U
4,7-Methano-1H-Indene	170 NJ	70 NJ	69 NJ	U
Benzene, 1-methylethyl	U	47 NJ	49 NJ	29 NJ
Benzene, 2-ethylethenyl-1,4-Dimethyl	U	U	U	34 NJ
Benzenamine, 2,6-Dimethyl	410 NJ	390 NJ	290 NJ	U
Benzenamine, 2,3-Dimethyl	400 NJ	86 NJ	510 NJ	U
Benzenamine, 2,4-Dimethyl	U	45NJ	U	U
Benzenamine, 3,5-Dimethyl	68 NJ	380 NJ	85 NJ	U
Indane	U	59 NJ	63 NJ	34 NJ
O-Chloroaniline	U	81 NJ	83 NJ	U
Benzene, 4-Ethyl-1,2-Dimethyl	U	U	U	64 NJ
Benzene, 1,2,3,4-Tetramethyl	U	U	U	46 NJ
Benzene, 1,2,4,5-Tetramethyl	U	U	U	37 NJ

U = The analyte was not detected at or above the Reporting Limit.

NJ = There is presumptive evidence that the analyte is present; the analyte is reported as a tentative identification. The reported value is an estimate.

(300) = (SGWQC)

Bold = above criteria

TABLE 5
Lead in Sediment and Sediment Porewater
Riverside Avenue Site
Newark, New Jersey

Sample Location	Lead Concentration	
	Sediment mg/kg	Sediment Porewater µg/L
SED-2	710	310
SED-3	760	NA
SED-4	640	NA
SED-5	780	290
SED-6	600	470
SED 6-7	720	250
SED-7	680	330
SED 7-8	630	760
SED 7-8D	620	86
SED-8	940	910
SED-9	830	650
SED-10	360	1,100

NJDEP NRDCSCC for lead = 600 mg/kg

NJDEP SGWQC for lead = 5 µg/L (unfiltered)

Bold = above criteria

NA = Not available

TABLE6
Volatile Organic Compounds in Sediment
Riverside Avenue Site
Newark, New Jersey

Analyte	Concentration (µg/kg)											
	SED-2	SED-3	SED-4	SED-5	SED-6	SED 6-7	SED-7	SED 7-8	SED 7-8D	SED-8	SED-9	SED-10
Acetone (1,000,000/100,000)	670 L	470	150	690 L	320	590 L	340	87	99	720 L	360 L	25
Benzene (13,000/1000/340)	30									300	11	
Bromomethane (1,000,000/1,000)							71 J					
2-Butanone (1,000,000/50,000)	540 K	110								22	22	
Carbon Disulfide	180 K	49	100	170	45	47	46	25	28	83	140	7.3
Chlorobenzene (680,000/1,000/291)	91 L		19 L	31	19 L							
Cyclohexane						67	240		12	23		
Ethylbenzene (1,000,000/100,000/175)	170 L					17						
Isopropylbenzene	140 L	25 L	21 L	77	27 L	33	290 L	21	23	96 J	29 L	
Methylcyclohexane	98	26	25	92	56	100 L	380	18	43	160		
Toluene (1,000,000/500,000/1,200)	470 L			61	17 L	39	20 L			30,000 L		
M+P-Xylene (1,000,000/67,000/433)*	15,000 L	120 L	17	2,200 L	20 L	350	110 L					
O-Xylene (1,000,000/67,000/433)*	3,800 L	59 L	30	600 L	22 L	160 L	61 L		14	85 J		
Benzene,1,2,3-Trimethyl				660 NJ								
Benzene,1-(1-formylethyl)					410 NJ							
1-Buten-3-yne,2-methyl										230 NJ		
Cobalt, (2-Methyl-ETA-3-Propen				980 NJ								
Cyclohexane,1,3-Dimethyl							460 NJ					
Cyclohexane,1,2-Dimethyl								210 NJ	360 NJ	280 NJ		
Cyclohexane, Butyl		310 NJ	410 NJ			330 NJ						
Cyclohexane, Ethyl						220 NJ	510 NJ					
Cyclohexane, 1,1,3-trimethyl							410 NJ		190 NJ	530 NJ		
Cyclohexane,1,2,3-Trimethyl								120 NJ	190 NJ			
Cyclohexane,1,2,4-Trimethyl							390 NJ		230 NJ			
Cyclohexane,1,3,5-Trimethyl								120 NJ		320 NJ		
Cyclohexane,1-Ethyl-2-Methyl		290 NJ		490 NJ	420 NJ	300 NJ	590 NJ	240 NJ	410 NJ	290 NJ		
Cyclohexane,1-Ethyl-3-Methyl											160 NJ	
Cyclohexane, (2-Methylpropyl)	860 NJ			600 NJ	510 NJ							
Cyclohexanepropanol						320 NJ	440 NJ	190 NJ				
Cyclohexanone,1,1,2,3-Tetramethyl						280 NJ	470 NJ	170 NJ	260 NJ			
Cyclopentane, 1,1,3-Trimethyl									200 NJ	460 NJ		
Cyclopentane, 1,2,3-trimethyl										390 NJ		
Cyclopentane,1,2,4-trimethyl								130 NJ	280 NJ	740 NJ		
Cyclopentane,1-ethyl-2-methyl		320 NJ										
Decane, 4-Methyl	1,300 NJ	290 NJ	470 NJ	750 NJ		400 NJ	400 NJ				260 NJ	
Decane, 2,2,4-Trimethyl											230 NJ	
Diisopropyl Ether						230 NJ		150 NJ			20 NJ	24 NJ
1-Ethyl-4-Methylcyclohexane							300 NJ					
Hexane, 2,2,5-Trimethyl				700/750 NJ	440 NJ							
Hexane, 2,2,4-Trimethyl											280 NJ	
Hexane, 2,5-Dimethyl										250 NJ		
Hexane, 2,4-Dimethyl										280 NJ		
Hexadecane											360 NJ	
Heptane, 2,2-Dimethyl											210 NJ	
Heptane, 2,2,4,6,6-Pentamethyl				530 NJ								
1H-Indene,2,3,-Dihydro			890 NJ	730 NJ	1,300 NJ						370 NJ	
10H-Phenothiazin-3-OL,2-Chloro											260 NJ	
5-Nonadecen-1-ol								110 NJ				
Octane, 2-methyl	770 NJ											
Octane, 2,3-dimethyl		250 NJ										
Octane, 2,6-dimethyl			460 NJ		510 NJ							
Octane,2,2,6-trimethyl			340 NJ								240 NJ	
Octane, 2,4,6-Trimethyl					640 NJ							
3-Octene, 4-ethyl		270 NJ										
Sulfur Dioxide	2,700 NJ	1,600 NJ	3,000 NJ	5,300 NJ	710 NJ	240/1,200 NJ		250 NJ		1,100 NJ		200 NJ
Sufurous Acid, Hexyl Pentadecyl											200 NJ	
Undecane, 3,9-Dimethyl				1,000 NJ								

K = The identification of the analyte is acceptable; the reported value may be biased high
L = The identification of the analyte is acceptable; the reported value may be biased low
NJ = There is presumptive evidence that the analyte is present; the analyte is reported as a tentative identification. The reported value is an estimate
* criteria and guidance is for total xylenes
(10,000,000/100,000/340) = (NRDCSCC/IGWSCC/fwBEE), fwBEE is fresh water sediment guidance for baseline ecological evaluations, effects range low
Bold = above criteria; *italics* = above fwBEE
When comparing the analyte concentrations found in the sediment against the values found in the Ecological Screening Criteria Table used for performing a Baseline Ecological Evaluation, 4 samples contain VOCs that exceed the guideline.

TABLE 7
Semivolatile Organic Compounds in Sediment
Riverside Avenue Site
Newark, New Jersey

Analyte	Concentration (µg/kg)											
	SED-2	SED-3	SED-4	SED-5	SED-6	SED 6-7	SED-7	SED 7-8	SED 7-8D	SED-8	SED-9	SED-10
Acenaphthene (10,000,000/100,000/16)										<i>6,600</i>		
Anthracene (10,000,000/100,000/160)										<i>12,000</i>		
Benzo(A)Anthracene (4,000/500,000/320)							<i>3,000</i>			<i>15,000</i>		
Benzo(A)Pyrene (660/100,000/370)							<i>4,600</i>			<i>13,000</i>		
Benzo(B)Fluoranthene (4,000/50,000/10,400)							<i>5,800</i>			<i>13,000</i>		
Benzo(K)Fluoranthene (4,000/500,000/170)										<i>5,400</i>		
Benzo(G,H,I)Perylene							2,700			5,800		
Bis(2-Ethylhexyl)Phthalate (210,000/100,000/182)	<i>4,500</i>	<i>5,300</i>	<i>14,000</i>	<i>25,000</i>	<i>17,000</i>	3,500 L	6,800	2,300		9,300	<i>5,100</i>	
Chrysene (40,000/500,000/340)							<i>3,400</i>			<i>13,000</i>		
Dibenzofuran										2,600		
Indeno(1,2,3-CD)Pyrene (4,000/500,000/200)							<i>2,500</i>			<i>4,800</i>		
Fluorene (10,000,000/100,000/140)										<i>7,500</i>		
Fluoranthene (10,000,000/100,000/750)							<i>2,400</i>			<i>29,000</i>		
Naphthalene (4,200,000/100,000/160)										<i>400,000</i>		
2-Methyl Naphthalene										16,000		
Pyrene (10,000,000/100,000/490)							<i>3,300</i>			<i>31,000</i>		
Phenanthrene (-/-/560)										<i>23,000</i>		
Phenanthrene, 1-Methyl-7-					2,200 NJ		1,100 NJ					
Triacetin					2,700 NJ							
Copaene										3,200 NJ		

K = The identification of the analyte is acceptable; the reported value may be biased high

L = The identification of the analyte is acceptable; the reported value may be biased low

NJ = There is presumptive evidence that the analyte is present; the analyte is reported as a tentative identification. The reported value is an estimate

(10,000,000/100,000/340) = (NRDSCC/IGWSCC/fwBEE), fwBEE is fresh water sediment guidance for baseline ecological evaluations, effects range low

Bold = above criteria; *italics* = above fwBEE

When comparing the analyte concentrations found in the sediment against the values found in the Ecological Screening Criteria Table used for performing a Baseline Ecological Evaluation, 10 samples contain SVOCs that exceed the guideline.

TABLE 8
Volatile Organic Compounds in Sediment Porewater
Riverside Avenue Site
Newark, New Jersey

Analyte	Concentration (µg/L)									
	SED-2	SED-5	SED-6	SED 6-7	SED-7	SED 7-8	SED 7-8D	SED-8	SED-9	SED-10
Acetone (600)	12 K									
Benzene (1)				6.2				41	7.1	
Cyclohexane				10						
Isopropylbenzene				30						
O-Xylene (1,000)								5.3		
1,3-Cyclopentadiene								11 NJ		
1-Buten-3-yne,2-methyl				10 NJ						
Benzene,(1-methylpropyl)				8.2 NJ						
1-Propene, 2-methyl								20 NJ		
2,3-Butanedione								11 NJ		
4,7-Methano-1H-Indene			61 NJ	240 NJ	13 NJ	6.5 NJ		95 NJ	35 NJ	
Cyclohexane,1,1,3-Trimethyl			12 NJ					12 NJ		
Cyclohexanone,3,3,5-Trimethyl										
Diisopropyl Ether (20,000)		36 NJ	320 NJ	340 NJ	210 NJ	400 NJ	410 NJ	1000 NJ	220 NJ	120 NJ
Diphenyl ether				8.5 NJ						
Ethyl Ether (1,000)				16 NJ	14 NJ	24 NJ	25 NJ	46 NJ	20 NJ	7.8 NJ
Furan, Tetrahydro (10)								14 NJ		
Indane				22 NJ						
Indan, 1-methyl				17 NJ						
Propane, 2-Ethoxy								13 NJ		
Propane, 2-Methoxy								30 NJ		
Sulfur Dioxide	270 NJ								18 NJ	90 NJ

K = The identification of the analyte is acceptable; the reported value may be biased high.

L = The identification of the analyte is acceptable; the reported value may be biased low.

NJ = There is presumptive evidence that the analyte is present; the analyte is reported as a tentative identification. The reported value is an estimate.

(600) = (SGWQC)

Bold = above criteria

TABLE 9
Semivolatile Organic Compounds in Sediment Porewater
Riverside Avenue Site
Newark, New Jersey

Analyte	Concentration (µg/L)									
	SED-2	SED-5	SED-6	SED 6-7	SED-7	SED 7-8	SED 7-8D	SED-8	SED-9	SED-10
Bis(2-Ethylhexyl)Phthalate (30)	20	5.4	5.4	30	27		25	29	52	13
4-Chloroaniline (30)								16		
Fluoranthene (300)							11			
Pyrene (200)							12			
Benzo(a)anthracene (0.1)							9.4			
Chrysene (5)							10			
Benzo(b)fluoranthene (0.2)							12			
Benzo(k)fluoranthene (0.5)							9.3			
Benzo(a)pyrene (0.1)							7.7			
Indeno(1,2,3-cd)pyrene (0.2)							6.2			
Benzo(g,h,i)perylene							6.4			
Naphthalene (300)								5.5		
Cyclohexanamine, N-Methyl			77 NJ	120 NJ	27 NJ	230 NJ	46 NJ			
Cyclohexanamine, N,N-Dimethyl				40 NJ		26 NJ	15 NJ		8.8 NJ	
Cyclohexanone, 3,3,5-Trimethyl			32 NJ							
3,3-Dimethylheptanoic								24 NJ		
4,7-Methano-1H-Indene			37 NJ	140 NJ	11 NJ				27 NJ	
Hexanoic Acid, 3,3,5-Trimethyl					10 NJ					
Hexanoic Acid, 3,5,5-Trimethyl							33 NJ			
Hexandioic Acid, Bis(2-Ethyl)		33 NJ								
O-Chloroaniline			18 NJ	69 NJ	26 NJ	87 NJ	87 NJ	31 NJ	11 NJ	39 NJ
Benzenamine, 2,3-Dimethyl				820 NJ	200 NJ					
3-Morpholino-1,2-Propanediol					12 NJ	26 NJ				
Diphenyl Ether					11 NJ					
M-Chloroaniline									43 NJ	
Moclobemide										22 NJ
Phenol, 4-(1,1-Dimethylpropyl)										23 NJ
Phenol, 2,4,6-Trimethyl						32 NJ	39 NJ		25 NJ	
Benzenamine, 2,6-dimethyl				140 NJ						
Hexanoic acid, 3,4,4-trimethyl										
Acetamide, n,n-dibutyl							13 NJ			
Benzenemethanamine, n,. Alpha							14 NJ			
Cyclotetrasiloxane	7.0 NJ									

K = The identification of the analyte is acceptable; the reported value may be biased high

L = The identification of the analyte is acceptable; the reported value may be biased low

NJ = There is presumptive evidence that the analyte is present; the analyte is reported as a tentative identification. The reported value is an estimate

(30) = (SGWQC)

Bold = above criteria

TABLE 10
Volatile Organic Compounds in Sediment from Building 7
Riverside Avenue Site
Newark, New Jersey

Analyte	Concentration µg/kg
	B7-1
Acetone (1,000,000/100,000)	1,200
Benzene (13,000/1,000)	1,400
2-Butanone (1,000,000/50,000)	1,000
Carbon Disulfide	87 J
Chlorobenzene (680,000/1,000)	650 L
1,1-Dichloroethane (1,000,000/10,000)	140 J
1,1-Dichloroethene (150,000/10,000)	28 J
1,4-Dichlorobenzene (10,000,000/100,000)	2,100 J
1,2,4-Trichlorobenzene (1,200,000/100,000)	120 J
1,2,3-Trichlorobenzene	15 J
1,1,2-Trichloro-1,2,2-Trifluoroethane	22 J
1,1,1-Trichloroethane (1,000,000/50,000)	2,500
Chloroform (28,000/1,000)	150 J
Cyclohexane	37 J
Ethylbenzene (1,000,000/100,000)	11,000 L
Isopropylbenzene	2,500 L
Methylene Chloride (210,000/1,000)	740
Methylcyclohexane	120 J
4-Methyl-2-Pentanone	320 L
M+P-Xylene (1,000,000/67,000)*	11,000 L
O-Xylene (1,000,000/67,000)*	7,900 L
Styrene (97,000/100,000)	11,000 L
Trichloroethene (54,000/1,000)	34 J
Tetrachloroethene (6,000/1,000)	830 L
Toluene (1,000,000/500,000)	38,000 L
Benzene,1,2,3-Trimethyl	290 NJ
Cyclohexane, Ethyl	300 NJ
Cyclohexane,1,1,3-Trimethyl	300 NJ
Cyclohexane,1,2,4-Trimethyl	350 NJ
Cyclopentane, 1-Methyl-2-Propyl	350 NJ
2-Cyclohexen-1-One,4,5-Dimethyl	330 NJ
Diisopropyl Ether	820 NJ
Furan,2,3-Dihydro-4-(1-Methyl	240 NJ
Heptane, 2,6-Dimethyl	350 NJ
Propane, 1-Bromo-2-Methyl	320 NJ
Sulfur Dioxide	320 NJ

K = The identification of the analyte is acceptable; the reported value may be biased high
L = The identification of the analyte is acceptable; the reported value may be biased low
NJ = There is presumptive evidence that the analyte is present; the analyte is reported as a tentative identification. The reported value is an estimate.

Table 11
Semivolatile Organic Compounds in Sediment from Building 7
Riverside Avenue Site
Newark, New Jersey

Analyte	Concentration µg/kg
	B7-1
Benzo(a)Anthracene (4,000/500,000)	2,200
Benzo(a)Pyrene (660/100,000)	1,800
Benzo(b)Fluoranthene (4,000/50,000)	2,600
Bis(2-Ethylhexyl)Phthalate (210,000/100,000)	15,000
Chrysene (40,000/500,000)	2,400
4-Chloroaniline (42,000/not determined)	18,000
Di-N-Octyl Phthalate	8,500
Fluorene (10,000,000/100,000)	1,800
Fluoranthene (10,000,000/100,000)	4,500
Naphthalene (42000/100,000)	6,300
2-Methyl Naphthalene	13,000
Phenol	3,800 K
2-Methylphenol	14,000 K
4-Methylphenol	6,100 K
Pyrene (10,000,000/100,000)	3,800
Phenanthrene	6,300
O-Chloroaniline	3,700 NJ
N-Decanoic Acid	14,000 NJ
N-Hexadecanoic Acid	16,000 NJ
9-Octadecenoic Acid	4,700 NJ
Tetradecanoic Acid	4,200 NJ
Tetradecane	2,800 NJ
Hexadecane	2,900 NJ
Heptadecane	4,500 NJ
2-Propanol, 1-Chloro	9,200 NJ

K = The identification of the analyte is acceptable; the reported value may be biased high.

L = The identification of the analyte is acceptable; the reported value may be biased low.

NJ = There is presumptive evidence that the analyte is present; the analyte is reported as a tentative identification. The reported value is an estimate.

(10,000,000/100,000) = (NRDCSCC/IGWSCC)

Bold = above criteria

TABLE 12
Volatile Organic Compounds in Water from Building 7
Riverside Avenue Site
Newark, New Jersey

Analyte	Concentration µg/L			
	B7-1	B7-2	B7-3	B7-4
Acetone (6000)			620 K	530 K
Benzene (1)	15 L	7.6 L	26	12
2-Butanone	500 K	460 K	590 K	480 K
1,1-Dichloroethane (50)	59 L	37 L	76	37
1,2-Dichlorobenzene (600)	13 J	15 J	19	11
1,4-Dichlorobenzene (75)		6.5 J		
1,2,4-Trichlorobenzene (9)	51 J	62 J	49	34
1,2,3-Trichlorobenzene	14 J	14 J	12	9.4
1,1,1-Trichloroethane (30)	150 L	100 L	580	250
Chlorobenzene (50)				21
Chloroform (70)	78 L	46 L	210	76
Cyclohexane			9.5	5.6
Ethylbenzene (700)	130 J	100 J	95	84
Isopropylbenzene	6.3 J	5.5 J	5.7	
Methylene Chloride (3)	940	560	1000	600
Methylcyclohexane	0.12 J		14	7.2
4-Methyl-2-Pentanone	95 J	45 J	75	47
M+P-Xylene (1000)*	43 J	31 J	190	77
O-Xylene (1000)*	31 J	23 J	200	86
Styrene (100)	27 J	19 J	65	25
Trichloroethene (1)	5.6 L		75	24
Tetrachloroethene (1)	7.1 J		49 J	15 J
Toluene (600)	180 J	110 J	910	530
Benzene,1,2,3-Trimethyl	42 NJ	60 NJ	71 NJ	61 NJ
Benzene,1,2,4-Trimethyl	28 NJ			
Benzene,1,3,5-Trimethyl		72 NJ		48 NJ
Benzene,1-chloro-2-methyl			66 NJ	
Benzene,1-ethyl-3-methyl		60 NJ		
Benzene, bromo			220 NJ	71 NJ
Benzoic acid, butyl ester		45 NJ		
2-Butanol	33 NJ			
Cyclopentane, propyl			80 NJ	63 NJ
Diisopropyl Ether (20,000)	1400 NJ	750 NJ	1000 NJ	660 NJ
Dimethyl sulfide	88 NJ	110 NJ	140 NJ	79 NJ
Furan, tetrahydro (10)	170 NJ	79 NJ		54 NJ
Hydrogen chloride	150 NJ			
Isooctanol			110 NJ	
Naphthalene,1,2,3,4-tetrahydro			260 NJ	170 NJ
Naphthalene, 1-chloro				72 NJ
3-Octene				41 NJ
Pentane, 2-cyclopropyl			93 NJ	
Phenol, 2-methyl	37 NJ	55 NJ		
Propane, 1-Bromo-2-Methyl			63 NJ	
Sulfur Dioxide	38 NJ			

K = The identification of the analyte is acceptable; the reported value may be biased high.

L = The identification of the analyte is acceptable; the reported value may be biased low.

NJ = There is presumptive evidence that the analyte is present; the analyte is reported as a tentative identification. The reported value is an estimate.

TABLE 13
Semivolatile Organic Compounds in Water from Building 7
Riverside Avenue Site
Newark, New Jersey

Analyte	Concentration µg/L			
	B7-1	B7-2	B7-3	B7-4
Bis(2-Ethylhexyl)Phthalate (3)			64	30 K
2-Chloronaphthalene			180	120
2,4-Dimethylphenol	290	150	790	320
Diethylphthalate	61 K		150	69 K
Di-N-Octyl Phthalate		490		6.4 K
Naphthalene (300)				38 K
4-Nitrophenol	48 K			
2-Methyl Naphthalene	8.8 K	21 K	6.7 K	5.6 K
Phenol (2000)	3,000	1,200	4,200	2,200
2-Methylphenol	5,300	2,900	9,600	5,500
4-Methylphenol	1,300	600	2,600	1,200
Phenanthrene		19		
1,2-Benzenedicarboxylic Acid		18 NJ		
Benzenecarboxylic Acid				61 NJ
O-Chloroaniline	30 NJ		17 NJ	
1-Decanaminium, N,N,N-Trimethyl			35 NJ	
1-Hexadecanamine, N,N-Dimethyl				46 NJ
M-Chloroaniline		27 NJ		
4,7-Methano-1H-Indene	9 NJ		19 NJ	
P-Menth-1-en-8-ol	9.6 NJ			
Octadecylbenzyltrimethylammonium				36 NJ
Pentanoic Acid	11 NJ			
Phenol, 2,4,6-Trimethyl		22 NJ		33 NJ
Phosphoric Acid, Trioctyl Ester			65 NJ	
Phthalic Acid, 4-Octyl			16 NJ	
Phthalic Acid, Isobutyl 2-pen		46 NJ		
Phthalic Acid, Isohexyl		78 NJ		
Phthalic Acid, Nonyl 2-Pentyl		46 NJ		
Phthalic Acid, Decyl Nonyl		27 NJ		
Phenol, 2,3,5-Trimethyl	7.7 NJ			
Phosphoric Acid, Tris(2-ethylx)				67 NJ
2(1H)-Quinolinone	7.9 NJ			
Tetradecane		22 NJ		
1-Tetradecanamine, N,N-Dimethyl				80 NJ
2,5,8,11-Tetraoxatetradecane				40 NJ
Undecane		22 NJ		

K = The identification of the analyte is acceptable; the reported value may be biased high.

L = The identification of the analyte is acceptable; the reported value may be biased low.

NJ = There is presumptive evidence that the analyte is present; the analyte is reported as a tentative identification. The reported value is an estimate.

(300) = (SGWQC)

Bold = above criteria

Table 14
Detected VOCs and the Media and Investigation Where Detected
Riverside Avenue Site
Newark New Jersey

Analyte	Lockheed Martin					Lockheed Martin			Tetra Tech		BSG/PMK			
	(2011)					(2010)			(2010)		(2009)			
	sediment	pore water	groundwater	B7 water	B7 sediment	sediment	soil	groundwater	B7 water	B7 sediment	underground storage tanks	soil	groundwater	B7 water
Target Compound List														
Acetone	x	x		x	x		x		x	x				
Benzene	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Bromochloromethane	x									x				
Bromoform										x				
Bromomethane														
2-Butanone	x			x	x				x	x				
Carbon Disulfide	x				x									
Carbon tetrachloride									x	x				
Chlorobenzene	x		x	x	x				x	x				
Chloroform				x	x				x	x				x
Cyclohexane	x	x	x	x	x		x	x		x				
1,1-Dichloroethane				x	x				x					x
1,1-Dichloroethene					x				x	x				x
1,2-Dichlorobenzene				x					x					x
1,3-Dichlorobenzene										x				
1,4-Dichlorobenzene				x	x				x	x				
Ethylbenzene	x		x	x	x		x	x		x	x	x		
2-Hexanone										x				
Isopropylbenzene	x	x	x	x	x		x	x		x				
Methyl acetate							x		x	x				
Methylcyclohexane	x		x	x	x		x	x		x				
Methylene Chloride			x	x	x			x	x	x				x

Table 14
Detected VOCs and the Media and Investigation Where Detected
Riverside Avenue Site
Newark New Jersey

4-Methyl-2-Pentanone			X	X	X				X	X				
Methyl tert-butyl ether								X		X				
Styrene				X	X				X	X				
1,1,2,2-Tetrachloroethane										X				
Tetrachloroethene				X	X				X	X	X			
1,2,4-Trichlorobenzene				X	X				X					
1,2,3-Trichlorobenzene				X	X				X	X				
1,1,1-Trichloroethane				X	X				X	X				X
1,1,2-Trichloroethane										X				
Trichloroethene				X	X				X		X			X
1,1,2-Trichloro-1,2,2-Trifluoroethane					X					X				
Toluene	X			X	X		X	X		X	X	X		X
Vinyl Chloride														X
M+P-Xylene	X		X	X	X		X	X		X				
O-Xylene	X	X	X	X	X		X	X		X				
Xylene (total)											X			X
TICs														
.alpha.-Phellandrene										X				
Azulene										X				
Benzene, bromo				X										
Benzene,1-(1-formylethyl)	X													
Benzene, 1-Methyl-2-Propyl			X											
Benzene,1-chloro-2-methyl				X				X		X				
Benzene, 1-chloro-4-methyl-								X						
Benzene, cyclopropyl-								X						
Benzene, 1,2-diethyl-							X	X						
Benzene, 1,3-Diethyl			X					X	X	X				
Benzene, 1,4-diethyl-							X	X						
Benzene, 1,3-dimethyl-5-(1-...										X				

Table 14
Detected VOCs and the Media and Investigation Where Detected
Riverside Avenue Site
Newark New Jersey

Benzene, dimethyl-nitro-											X			
Benzene, pentamethyl-											X			
Benzene, 2-ethenyl-1,4-dimethyl-								X						
Benzene, 1-Ethenyl-3-Ethyl			X					X						
Benzene, 1-Ethenyl-4-Ethyl			X											
Benzene, 1-ethenyl-2-methyl-								X						
Benzene, 1-ethyl-2,3-dimethyl-							X				X			
Benzene, 1-ethyl-2,4-dimethyl-							X	X	X	X				
Benzene, 1-Ethyl-3,5-Dimethyl			X					X			X			
Benzene, 1-ethyl-2-methyl-										X	X			
Benzene, 1-ethyl-3-methyl				X				X	X	X				
Benzene, 2-Ethyl-1,3-Dimethyl			X				X	X			X			
Benzene, 2-ethyl-1,4-Dimethyl			X				X	X			X			
Benzene, 4-ethyl-1,2-dimethyl-								X			X			
Benzenemethanol, -methyl-,											X			
Benzene, 1-methyl-2-(1-methylethyl)-			X					X	X	X				
Benzene, 1-methyl-3-(1-methylethyl)-								X			X			
Benzene, 1-methyl-4-(1-methylethyl)-								X			X			
Benzene, (2-methyl-1-propenyl)-								X						
Benzene, methoxy-											X			
Benzene, (1-Methylpropyl)		X	X					X						
Benzene, Propyl			X				X	X	X	X				
Benzene, 1-propenyl-											X			
Benzene, tert-butyl-								X						
Benzene, 1,2,3,4-Tetramethyl			X					X	X	X				
Benzene, 1,2,3,5-tetramethyl-								X			X			
Benzene, 1,2,4,5-Tetramethyl			X					X	X					
Benzene, 1,2,3-Trimethyl	X		X	X					X	X				
Benzene, 1,2,4-Trimethyl-				X				X						

Table 14
Detected VOCs and the Media and Investigation Where Detected
Riverside Avenue Site
Newark New Jersey

[illegible]

Table 14
Detected VOCs and the Media and Investigation Where Detected
Riverside Avenue Site
Newark New Jersey

Hexane, 2,2,5-Trimethyl	x													
Hexane, 2,2,4-Trimethyl	x													
Hexane, 2,5-Dimethyl	x													
Hexane, 2,4-Dimethyl	x													
Hexadecane	x													
Hexanal										x				
Heptane, 2,2-Dimethyl	x													
Heptane, 2,2,4,6,6-Pentamethyl	x													
Hydrogen chloride				x										
Indane		x	x					x						
Indan, 1-Methyl		x	x					x		x				
1H-Indene, dimethyl-											x			
1H-Indene, dihydro-dimethyl											x			
1H-Indene, 2,3-dihydro-1,6-dimethyl-								x						
1H-Indene, 2,3-dihydro-2-methyl-								x						
1H-Indene, 2,3-Dihydro-4-Methyl			x					x						
1H-Indene, 2,3-Dihydro-5-Methyl			x											
1H-Indene,2,3,-Dihydro	x													
1H-Indene, octahydro-, cis-								x						
1H-Indene, 3a,4,7,7a-tetrahydro-								x						
Isooctanol				x										
d-Limonene										x				
10H-Phenothiazin-3-OL,2-Chloro	x							x						
1,3,4-Metheno-1H-cyclobuta[cd]pentalene,														
4,7-Methano-1H-Indene		x	x					x	x					
4,7-Methano-1H-indene, 3a,4,7,7a-tetrahy								x						
Naphthalene, decahydro-, trans-				x										
Naphthalene,1,2,3,4-tetrahydro				x						x	x			
Naphthalene, 1-chloro											x			

[illegible]

Table 15
Detected SVOCs and the Media and Investigation Where Detected
Riverside Avenue Site
Newark New Jersey

Analyte	Lockheed Martin					Lockheed Martin			Tetra Tech		BSG/PMK			
	(2011)					(2010)			(2010)		(2009)			
	sediment	pore water	groundwater	B7 water	B7 sediment	sediment	soil	groundwater	B7 water	B7 sediment	underground storage tanks	soil	groundwater	B7 water
Target Compound List														
Acenaphthene	x					x	x				x			
Acetophenone							x		x	x				
Anthracene	x					x	x				x			
Benzo(a)anthracene	x	x			x	x	x				x	x	x	x
Benzo(a)pyrene	x	x			x	x	x				x	x	x	x
Benzo(b)fluoranthene	x	x				x	x				x		x	x
Benzo(k)fluoranthene	x	x			x	x	x				x			x
Benzo(g,h,i)perylene	x	x				x	x				x	x		x
Bis(2-Ethylhexyl)Phthalate	x	x		x	x	x	x	x		x	x		x	
1,1'-Biphenyl							x		x	x				
Caprolactam						x	x	x	x					
4-Chloroaniline		x			x	x		x	x	x				
2-Chloronaphthalene				x						x				
Chrysene	x	x			x	x	x				x	x	x	x
Dibenzo(a,h)anthracene						x	x					x		
Dibenzofuran	x					x	x		x	x				
Diethylphthalate				x				x	x	x				
2,4 -Dichlorophenol											x			
2,4-Dimethylphenol				x								x	x	
2,4,6-Trichlorophenol											x			
Di-n-butylphthalate								x		x				
Di-N-Octyl Phthalate				x	x						x			

Table 15
Detected SVOCs and the Media and Investigation Where Detected
Riverside Avenue Site
Newark New Jersey

Analyte	Lockheed Martin					Lockheed Martin			Tetra Tech		BSG/PMK			
	(2011)					(2010)			(2010)		(2009)			
	sediment	pore water	groundwater	B7 water	B7 sediment	sediment	soil	groundwater	B7 water	B7 sediment	underground storage tanks	soil	groundwater	B7 water
Indeno(1,2,3-cd)pyrene	x	x				x	x				x	x	x	x
Fluorene	x				x	x	x				x			
Fluoranthene	x	x			x	x	x	x		x	x			
Naphthalene	x	x	x	x	x	x	x	x		x	x			
2-Methyl Naphthalene	x			x	x	x	x			x				
2-Methylphenol				x	x				x	x				
4-Methylphenol			x	x	x			x	x	x				
Nitrobenzene									x					
4-Nitrophenol				x										
Phenanthrene	x			x	x	x	x	x		x	x			
Phenol				x	x	x				x	x			x
Pyrene	x				x	x	x	x			x	x	x	x
TICS														
Acenaphthylene						x	x							
Acetamide, N-(2,3-dimethylphenyl)-								x						
Acetamide, n,n-dibutyl		x												
Acetamide, N-phenyl-										x				
7-Acetyl-6-ethyl-1,1,4,4-tetramethyltetra						x								
Adamantane											x			
Adamantane, 1,3-dimethyl-							x							
Anthracene														
Anthracene, 2-methyl-							x							
9,10-Anthracenedione							x							

Table 15
Detected SVOCs and the Media and Investigation Where Detected
Riverside Avenue Site
Newark New Jersey

Analyte	Lockheed Martin					Lockheed Martin			Tetra Tech		BSG/PMK			
	(2011)					(2010)			(2010)		(2009)			
	sediment	pore water	groundwater	B7 water	B7 sediment	sediment	soil	groundwater	B7 water	B7 sediment	underground storage tanks	soil	groundwater	B7 water
12-Azabicyclo[9.2.2]pentadecan-13-one						x								
Azoxybenzene						x								
Benzaldehyde						x								
Benzene, bromo-										x				
Benzene, (1-butylhexyl)-						x								
Benzene, 1-chloro-3-isocyanato-						x								
Benzene, (1-ethyldecyl)-						x								
Benzene, (1-propyloctyl)-						x								
Benzenamine, 2,6-Dimethyl		x	x											
Benzenamine, 2,3-Dimethyl		x	x											
Benzenamine, 2,4-Dimethyl			x					x						
Benzenamine, 2,5-dimethyl-								x						
Benzenamine, 3,5-Dimethyl			x					x						
Benzenamine, 2-methoxy-5-me...										x				
Benzenecarboxylic Acid														
1,2-Benzenedicarboxylic Acid				x										
Benzenemethanamine, n,. Alpha		x												
Benzene, 1-butyl-4-methoxy-								x						
Benzene, 1-chloro-2-nitro-							x		x	x				
Benzene, 1-chloro-3-nitro-										x				
Benzene, 1-chloro-4-nitro-										x				
Benzene, 1,1'-(1,2-cyclobut...										x				
Benzene, 1,2-diethyl-							x	x						

Table 15
Detected SVOCs and the Media and Investigation Where Detected
Riverside Avenue Site
Newark New Jersey

Analyte	Lockheed Martin					Lockheed Martin			Tetra Tech		BSG/PMK			
	(2011)					(2010)			(2010)		(2009)			
	sediment	pore water	groundwater	B7 water	B7 sediment	sediment	soil	groundwater	B7 water	B7 sediment	underground storage tanks	soil	groundwater	B7 water
Benzene, 1,2-dimethyl-3-nitro-							x							
Benzene, 1,2-dimethyl-4-nitro-							x	x						
Benzene, 1,3-diethyl-							x	x		x				
Benzene, 1,4-diethyl-							x	x		x				
Benzene, 1,4-diethyl-2-methyl-							x		x					
Benzene, 2,4-diethyl-1-methyl-							x		x	x				
Benzene, 2-ethenyl-1,4-dimethyl-							x							
Benzene, 2-ethylethenyl-1,4-Dimemethyl			x											
Benzene, 4-ethyl-1,2-dimethyl			x											
Benzene, 1-ethyl-2,3-dimethyl-							x	x						
Benzene, 2-ethyl-1,4-dimethyl-							x	x						
Benzene, 1-ethyl-2,4-dimethyl-							x							
Benzene, 1-ethyl-3,5-dimethyl-							x	x						
Benzene, 1-ethyl-2-methyl-														
Benzene, 1-ethyl-3-methyl-														
Benzene, methoxy-										x				
Benzene, (1-methylethyl)-							x							
Benzene, 1-methyl-2-(1-methylethyl)-							x	x						
Benzene, 1-methyl-3-(1-methylethyl)-								x						
Benzene, 1-methyl-4-(1-methylethyl)-							x							
Benzene, 1-methylethyl			x					x						
Benzene, (1-methyl-1-butenyl)-								x						
Benzene, 1-methyl-4-(2-propenyl)-							x							

Table 15
Detected SVOCs and the Media and Investigation Where Detected
Riverside Avenue Site
Newark New Jersey

Analyte	Lockheed Martin					Lockheed Martin			Tetra Tech		BSG/PMK			
	(2011)					(2010)			(2010)		(2009)			
	sediment	pore water	groundwater	B7 water	B7 sediment	sediment	soil	groundwater	B7 water	B7 sediment	underground storage tanks	soil	groundwater	B7 water
Benzene, pentamethyl-							x							
Benzene, 1,2,3,4-Tetramethyl			x					x						
Benzene, 1,2,4,5-Tetramethyl			x				x	x		x				
Benzene, 1,3,5-trichloro-										x				
Benzene, 1,2,3-trimethyl-								x		x				
Benzene, 1,2,4-trimethyl-										x				
Benzene, 1,3,5-trimethyl-							x							
Benzenemethanol, .alpha.-me...									x					
Benzenesulfonamide, 4-methyl-									x					
Benz[a]anthracene, 7-methyl-							x							
11H-Benzo[a]fluoren-11-one							x							
11H-Benzo[a]fluorene							x							
11H-Benzo[b]fluorene						x	x							
Benzo[b]naphtho[2,1-d]thiophene							x							
Benzo[b]triphenylene							x							
Benzo[e]pyrene							x							
Benzo[j]fluoranthene							x							
Benzoic acid														
Benzoic acid, 2-hydroxy-, 3...										x				
Benzoic acid, 2,4,5-trimethyl-								x						
Benzonitrile, m-amino-										x				
Benzyl alcohol									x	x				
Bicyclo[4.2.0]octa-1,3,5-tr										x				

Table 15
Detected SVOCs and the Media and Investigation Where Detected
Riverside Avenue Site
Newark New Jersey

[illegible]

Table 15
Detected SVOCs and the Media and Investigation Where Detected
Riverside Avenue Site
Newark New Jersey

Analyte	Lockheed Martin					Lockheed Martin			Tetra Tech		BSG/PMK			
	(2011)					(2010)			(2010)		(2009)			
	sediment	pore water	groundwater	B7 water	B7 sediment	sediment	soil	groundwater	B7 water	B7 sediment	underground storage tanks	soil	groundwater	B7 water
Cyclohexanol, 1-methyl-4-(1-methylethyl)								x						
Cyclohexanol, -trimethyl-											x			
Cyclohexanone, -trimethyl-											x			
Cyclohexanone, 3,3,5-trimethyl		x	x					x						
Cyclohexasiloxane, dodecamethyl-						x								
N-Cyclohexyl-2-pyrrolidone								x						
Cyclic octaatomic sulfur								x						
Cyclopenta(cd)pyrene, 3,4-dihydro-							x							
4H-Cyclopenta[def]phenanthrene							x							
Cyclopenta[g]-2-benzopyran, 1,3,4,6,7,8-						x								
Cyclopentasiloxane, decamethyl-						x								
Cyclotetrasiloxane		x												
Cyclotetrasiloxane, octamethyl-						x		x						
Decahydro-4,4,8,9,10-pentamethylnaphthal						x	x							
1-Decanaminium, N,N,N-Trimethyl				x										
N-Decanoic Acid					x									
1-Decanol, 2-hexyl-							x							
Dibenzofuran, 4-methyl-							x							
Dibenzothiophene							x							
Dibenzothiophene, 4-methyl-							x							
Diboron(.mu.-selenium)diethylbis[.mu.-(1								x						
2,4-Dichlorophenol											x			x
p-Dicyclohexylbenzene										x				

Detected SVOCs and the Media and Investigation Where Detected
Riverside Avenue Site
Newark New Jersey

[illegible]

Table 15
Detected SVOCs and the Media and Investigation Where Detected
Riverside Avenue Site
Newark New Jersey

Analyte	Lockheed Martin					Lockheed Martin			Tetra Tech		BSG/PMK			
	(2011)					(2010)			(2010)		(2009)			
	sediment	pore water	groundwater	B7 water	B7 sediment	sediment	soil	groundwater	B7 water	B7 sediment	underground storage tanks	soil	groundwater	B7 water
Hexadecane					x									
N-Hexadecanoic Acid					x		x							
Hexadecanoic acid, methyl ester								x						
1-Hexadecanamine, N,N-Dimethyl				x										
Hexanoic Acid, 3,3,5-Trimethyl		x												
Hexanoic acid, 3,4,4-trimethyl		x												
Hexanoic Acid, 3,5,5-Trimethyl		x												
Hexandioic Acid, Bis(2-Ethyl)		x												
Isopropylbenzene								x						
p-Hydroxybiphenyl										x				
8-Hydroxyquinoline									x					
1H-Indene, 2,3-dihydro-1,1-dimethyl-								x						
1H-Indene, 2,3-dihydro-1,2-dimethyl-							x							
1H-Indene, 2,3-dihydro-4-methyl-							x							
1H-Indene, 2,3-dihydro-1,1,2,3,3-pentame						x								
1H-Indene, 2,3-dihydro-1,1,3-trimethyl-3						x								
Indane			x					x						
Indole											x			
2-Isopropyl-10-methylphenanthrene						x								
Mesitylacetic acid								x						
Methanethiol														
1-Methylindan-2-one						x								
1H-3a,7-Methanoazulene, 2,3,4,7,8,8a-hex						x			x					

Table 15
Detected SVOCs and the Media and Investigation Where Detected
Riverside Avenue Site
Newark New Jersey

Analyte	Lockheed Martin					Lockheed Martin			Tetra Tech		BSG/PMK			
	(2011)					(2010)			(2010)		(2009)			
	sediment	pore water	groundwater	B7 water	B7 sediment	sediment	soil	groundwater	B7 water	B7 sediment	underground storage tanks	soil	groundwater	B7 water
4,7-Methano-1H-Indene		x	x	x										
4,7-Methano-1H-indenol, hex...														
4,7-Methano-1H-indene, 3a,4,7,7a-tetrahy				x		x	x	x						
4,7-Methano-5H-inden-5-one, 3,3a,4,6,7,7								x						
P-Menth-1-en-8-ol														
2-Methyl-1-butene									x					
2-Methylnaphthalene								x						
2-Methylphenol								x						
Methyl Salicylate										x				
Methyl Isobutyl Ketone											x			
Moclobemide		x												
Morpholine, 4-acetyl-														
3-Morpholino-1,2-Propanediol		x						x						
Naphthalene, decahydro-							x							
Naphthalene, decahydro-, trans-							x							
Naphthalene, decahydro-2-methyl-							x							
Naphthalene dimethyl							x				x			
Naphthalene, 2,3-dimethyl-							x							
Naphthalene, 2,6-dimethyl-							x							
Naphthalene, 2,7-dimethyl-							x							
Naphthalene, 1,6-dimethyl-4-(1-methyleth														
Naphthalene trimethyl							x				x			
Naphthalene, 1-ethyl-							x							

Table 15
Detected SVOCs and the Media and Investigation Where Detected
Riverside Avenue Site
Newark New Jersey

Analyte	Lockheed Martin					Lockheed Martin			Tetra Tech		BSG/PMK			
	(2011)					(2010)			(2010)		(2009)			
	sediment	pore water	groundwater	B7 water	B7 sediment	sediment	soil	groundwater	B7 water	B7 sediment	underground storage tanks	soil	groundwater	B7 water
Naphthalene, 1-methyl-														
Naphthalene, methyl-														
Naphthalene, 2-methyl-							x							
Naphthalene, 2-phenyl-										x				
Naphthalene, 1,2,3,4-tetrahydro-						x								
Naphthalene, 1,2,3,4-tetrahydro-1,1,6-trimethyl-						x								
Naphthalene, 1,2,3,4-tetrahydro-1,6-dimethyl-							x							
Naphthalene, 1,4,6-trimethyl-							x							
Naphtho[3,4:2,3]bornene						x								
Naphtho[2,3-b]thiophene						x	x							
N-Hexadecanoic acid											x			
18-Norabietane						x	x							
4-Nitroaniline							x							
4-Nitrosophenyl-.beta.-phenylpropionate				x										
Octadecylbenzyltrimethylammonium					x									
9-Octadecenoic Acid							x							
Octadecanoic acid								x						
Octadecanoic acid, methyl ester							x							
Oleic Acid										x				
7-Oxodehydroabietic acid, methyl ester						x								
Phthalic anhydride											x			
1-Pentadecanol				x										
Pentanoic Acid							x							

Table 15
Detected SVOCs and the Media and Investigation Where Detected
Riverside Avenue Site
Newark New Jersey

[illegible]

Table 15
Detected SVOCs and the Media and Investigation Where Detected
Riverside Avenue Site
Newark New Jersey

Analyte	Lockheed Martin					Lockheed Martin			Tetra Tech		BSG/PMK			
	(2011)					(2010)			(2010)		(2009)			
	sediment	pore water	groundwater	B7 water	B7 sediment	sediment	soil	groundwater	B7 water	B7 sediment	underground storage tanks	soil	groundwater	B7 water
Phosphoric Acid, Tris(2-ethylx)							x							
Phosphoric acid, tris(2-ethylhexyl) este				x										
Phthalic Acid, 4-Octyl				x										
Phthalic Acid, Isobutyl 2-pen				x										
Phthalic Acid, Isohexyl														
Phthalic Acid, Nonyl 2-Pentyl				x										
Phthalic Acid, Decyl Nonyl							x	x						
Phthalic anhydride						x	x							
Pyrene, 1-methyl-						x								
Pyrene, 2-methyl-								x						
2(1H)-Pyridinone, 5-methyl-				x					x					
Quinoline				x										
2(1H)-Qunolinone										x				
Stannane, chlorotris(2-meth...							x			x				
Stannane, tetrabutyl-										x				
Stannane, tributylchloro-							x							
Stigmast-4-en-3-one										x				
Styrene								x						
Tetracyclo[3.3.1.1(3,7).0(4,6)]decan-2-o				x	x									
Tetradecane					x									
Tetradecanoic Acid						x								
6-Tetradecene, (Z)-				x										
1-Tetradecanamine, N,N-Dimethyl						x								

Table 15
Detected SVOCs and the Media and Investigation Where Detected
Riverside Avenue Site
Newark New Jersey

[illegible]

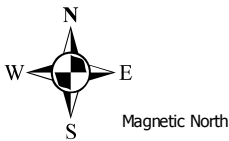
FIGURES



Map created using 2007 orthoimagery from NJGIN, site survey GPS data.

Map Creation Date: 20 July 2011

Coordinate system: New Jersey State Plane
FIPS: 2900
Datum: NAD83
Units: Feet



Legend

Proposed Sample Location

●

 Near Surface Soil Sample Location

●

 Sediment Sample Location

⊕

 Groundwater Monitor Well Location

▲

 Sediment & Water Sample Location

◆

 Water Sample Location

BLDG

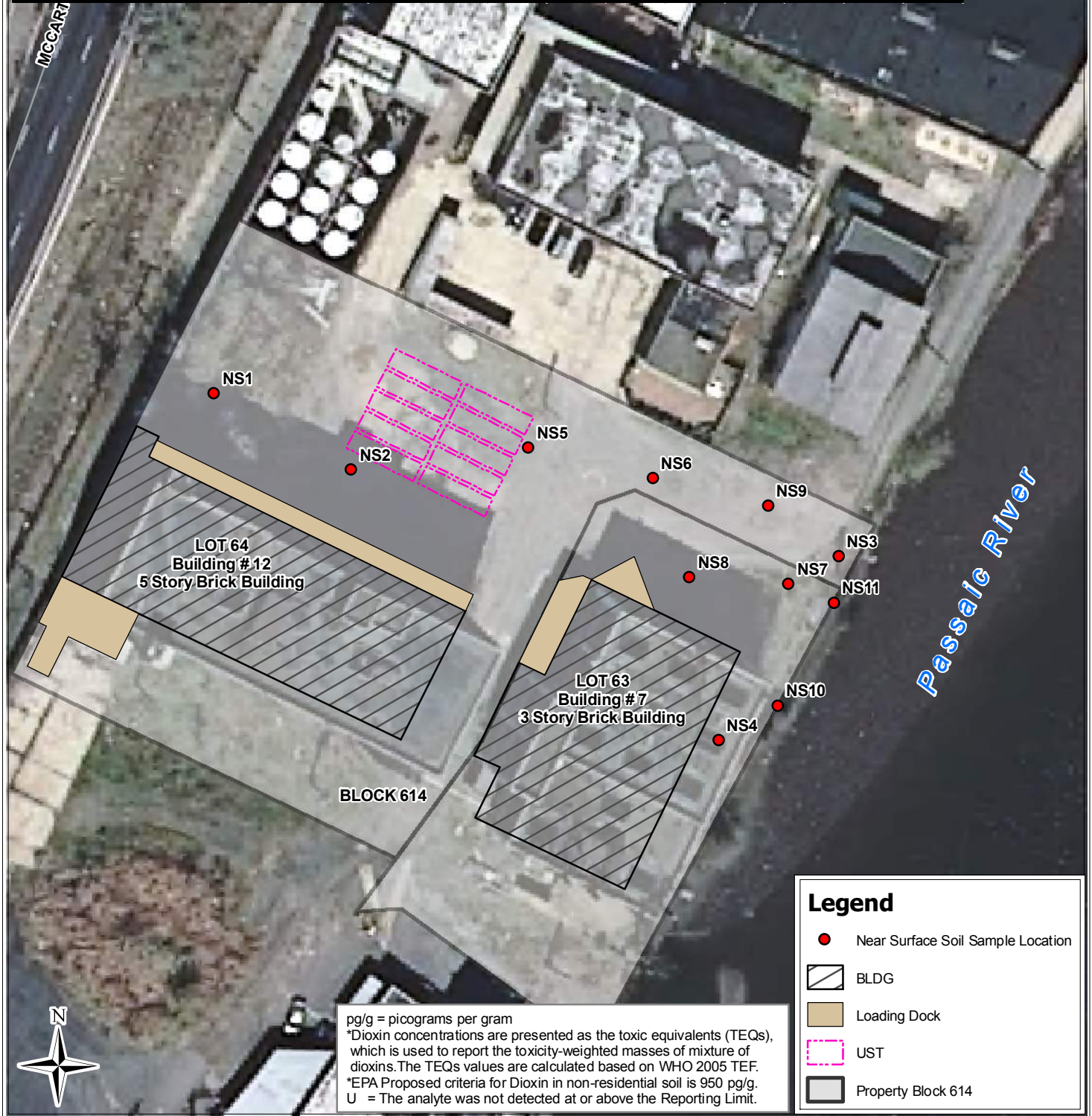
Loading Dock

UST

Property Block 614

Concentration Of Dioxin And Aroclors 1254 In Soil

Sample Location	NS-1	NS-2	NS-3	NS-4	NS-5	NS-6	NS-7	NS-7D	NS-8	NS-9	NS-10	NS-11
Dioxin TEQ WHO2005 * (Criteria: 950* pg/g)	34.8	16.3	54.9	3.54	3.93	4.85	11.6	8.57	107	21.5	147	234
PCB (Aroclors 1254) in Soil (Criteria: 2000 µg/kg)	3,000	230	630	81	55	82	U	U	U	400	120	160



Map created using 2007 orthoimagery from NJGIN, site survey GPS data, sample results data.

Map Creation Date: 19 July 2011

Coordinate system: New Jersey State Plane
 FIPS: 2900
 Datum: NAD83
 Units: Feet

60 0 60
 Feet

Data: g:\arcviewprojects\SERAS01\00-089
 MXD file: g:\arcinfo\projects\SERAS01\SER00089_RiversideNewark
 \089_DTM2011_Dioxin_PCB_Results_inSoil_f2

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 Scientific Engineering Response and Analytical Services
 EP-W-09-031
 W.A. # 0-089

Figure 2
 Dioxin & PCB Results in Soil
 29 Riverside Ave. (Phase 2 Assessment)
 Newark, New Jersey



Map created using 2007 orthoimagery from NJGIN, site survey GPS data, sample results data.

Map Creation Date: 7 July 2011

Coordinate system: New Jersey State Plane
FIPS: 2900
Datum: NAD83
Units: Feet

Data: g:\arcviewprojects\SERAS01\00-089
MXD file: g:\arcinfo\projects\SERAS01\SER00089_RiversideNewark
\089_DTM2011_VOC_SVOC_Results_inGroundwater_f3

U = The analyte was not detected at or above the Reporting Limit.
NJ = There is presumptive evidence that the analyte is present; the analyte is reported as a tentative identification. The reported value is an estimate.
D = Two concentrations were reported for this analyte.

Volatile Organic Compounds in Groundwater

Analyte	Concentration (µg/L)			
	ERT-1	ERT-2	ERT-2D	ERT-3
Methylene Chloride (3)	230	U	U	U
Cyclohexane	24	26	27	8.9
Benzene (1)	24	40	40	33
Methylcyclohexane	87	150	150	57
4-Methyl-2-Pentanone	U	17	17	U
Ethylbenzene (700)	U	7.5	7.9	19
M/P-Xylene (1000 Total Xylenes)	7.6	7.9	8.1	11
O-Xylene (1000 Total Xylenes)	5.2	6.8	7.0	U
Isopropylbenzene	36	170	170	38
1-Buten-3-yne, 2-Methyl	120 NJ	U	U	U
Diisopropyl Ether (20,000)	700 NJ	630 NJ	620 NJ	77 NJ
Chlorobenzene (50)	U	U	U	9.3
Benzene, 1-Methyl-2-Propyl	U	U	73 NJ	U
Benzene, (1-Methylpropyl)	34 NJ	72 NJ	U	U
Benzene, Propyl	U	150 NJ	150 NJ	U
4,7-Methano-1H-Indene	610 NJ	320 NJ	320 NJ	U
Indane	120 NJ	210 NJ	210 NJ	130 NJ
Benzene, 1,3-Diethyl	45 NJ	U	U	57 NJ
1-Phenyl-1-Butene	38 NJ	U	U	U
Benzene, 1-Ethyl-3,5-Dimethyl	U	U	77 NJ	U
Benzene, 1-Ethenyl-3-Ethyl	U	U	U	80 NJ
Benzene, 1-Ethenyl-4-Ethyl	U	100 NJ	U	U
Benzene, 1-Methyl-2-(1-Methyl)	U	U	U	250/48 DNJ
Benzene, 2-Ethyl-1,3-Dimethyl	58 NJ	U	U	U
Benzene, 1,2,3,4-Tetramethyl	U	76 NJ	U	150 NJ
Benzene, 2-ethyl-1,4-Dimethyl	47 NJ	120 NJ	120 NJ	U
Benzene, 1,2,4,5-Tetramethyl	U	91 NJ	91 NJ	200 NJ
Indan, 1-Methyl	84 NJ	U	100 NJ	U
1H-Indene, 2,3-Dihydro-4-Methyl	U	U	72 NJ	160 NJ
1H-Indene, 2,3-Dihydro-5-Methyl	U	71 NJ	U	76 NJ

Semivolatile Organic Compounds in Groundwater

Analyte	Concentration (µg/L)			
	ERT-1	ERT-2	ERT-2D	ERT-3
4-Methylphenol	U	U	U	8.6 L
Naphthalene (300)	U	U	U	22
Cyclohexanone, 3,3,5-trimethyl	U	U	U	33 NJ
Cyclohexanamine, N-methyl	190 NJ	U	U	U
Cyclohexanamine, N,N-methyl	110 NJ	U	U	U
4,7-Methano-1H-Indene	170 NJ	70 NJ	69 NJ	U
Benzene, 1-methylethyl	U	47 NJ	49 NJ	29 NJ
Benzene, 2-ethylethenyl-1,4-Dimemethyl	U	U	U	34 NJ
Benzenamine, 2,6-Dimethyl	410 NJ	390 NJ	290 NJ	U
Benzenamine, 2,3-Dimethyl	400 NJ	86 NJ	510 NJ	U
Benzenamine, 2,4-Dimethyl	U	45NJ	U	U
Benzenamine, 3,5-Dimethyl	68 NJ	380 NJ	85 NJ	U
Indane	U	59 NJ	63 NJ	34 NJ
O-Chloroaniline	U	81 NJ	83 NJ	U
Benzene, 4-Ethyl-1,2-Dimethyl	U	U	U	64 NJ
Benzene, 1,2,3,4-Tetramethyl	U	U	U	46 NJ
Benzene, 1,2,4,5-Tetramethyl	U	U	U	37 NJ

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EP-W-09-031
W.A.# 0-089

Figure 3
VOC & SVOC Results In Groundwater
29 Riverside Ave. (Phase 2 Assessment)
Newark, New Jersey

Lead in Sediment and Sediment Porewater

Sample Location	SED-2	SED-3	SED-4	SED-5	SED-6	SED 6-7	SED-7	SED 7-8	SED 7-8D	SED-8	SED-9	SED-10
Sediment (Criteria: 600 mg/kg)	710	760	640	780	600	720	680	630	620	940	830	360
Sediment Porewater (Criteria: 5 µg/L)	310	NA	NA	290	470	250	330	760	86	910	650	1,100

NA = Not available.



Legend

- Sediment Sample Location
- ▨ BLDG
- Loading Dock
- ▭ UST
- Property Block 614

Map created using 2007 orthoimagery from NJGIN, site survey GPS data, sample results data.

Map Creation Date: 19 July 2011

Coordinate system: New Jersey State Plane
FIPS: 2900
Datum: NAD83
Units: Feet

Data: g:\arcviewprojects\SERAS01\00-089
MXD file: g:\arcinfo\projects\SERAS01\SER00089_RiversideNewark
\089_DTM2011_Lead_Results_in_Sediment_SedimentPorewater_f4

U.S EPA Environmental Response Team
Scientific Engineering Response and Analytical Services
EP-W-09-031
W.A. # 0-089

Figure 4
Lead Results in Sediment and Sediment Porewater
29 Riverside Ave. (Phase 2 Assessment)
Newark, New Jersey



Semivolatile Organic Compounds in Sediment

Analyte	Concentration (µg/kg)											
	SED-2	SED-3	SED-4	SED-5	SED-6	SED 6-7	SED-7	SED 7-8	SED 7-8D	SED-8	SED-9	SED-10
Acenaphthene (10,000,000/100,000)										6,600		
Anthracene (10,000,000/100,000)										12,000		
Benzo(a)Anthracene (4,000/500,000)							3,000			15,000		
Benzo(a)Pyrene (660/100,000)							4,600			13,000		
Benzo(b)Fluoranthene (4,000/50,000)							5,800			13,000		
Benzo(k)Fluoranthene (4,000/500,000)										5,400		
Benzo(g,h,i)Perylene							2,700			5,800		
Bis(2-Ethylhexyl)Phthalate (210,000/100,000)	4,500	5,300	14,000	25,000	17,000	3,500	L 6,800	2,300		9,300	5,100	
Chrysene (40,000/500,000)							3,400			13,000		
Dibenzofuran										2,600		
Indeno(1,2,3-CD)Pyrene (4,000/500,000)							2,500			4,800		
Fluorene (10,000,000/100,000)										7,500		
Fluoranthene (10,000,000/100,000)							2,400			29,000		
Naphthalene (4,200,000/100,000)										400,000		
2-Methyl Naphthalene										16,000		
Pyrene (10,000,000/100,000)							3,300			31,000		
Phenanthrene										23,000		
Phenanthrene, 1-Methyl-7-					2,200	NJ		1,100	NJ			
Triacetin					2,700	NJ						
Copaene										3,200	NJ	

Map created using 2007 orthoimagery from NJGIN, site survey GPS data, sample results data.

Map Creation Date: 7 July 2011

Coordinate system: New Jersey State Plane

FIPS: 2900

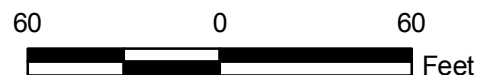
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MXD file: g:\arcinfo\projects\SERAS01\SER00089_RiversideNewark

\089_DTM2011_VOC_SVOC_Results_inSediment_f5



Volatile Organic Compounds in Sediment

Analyte	Concentration (µg/kg)																							
	SED-2		SED-3		SED-4		SED-5		SED-6		SED 6-7		SED-7		SED 7-8		SED 7-8D		SED-8		SED-9		SED-10	
Acetone (1,000,000/100,000)	670	L	470		150		690	L	320		590	L	340		87		99		720	L	360	L	25	
Benzene (13,000/1000)	30																	300		11				
Bromomethane (1,000,000/1,000)													71	J										
2-Butanone (1,000,000/50,000)	540	K	110																22		22			
Carbon Disulfide	180	K	49		100		170		45		47		46		25		28		83		140		7.3	
Chlorobenzene (680,000/1,000)	91	L			19	L	31		19	L														
Cyclohexane											67		240				12		23					
Ethylbenzene (1,000,000/100,000)	170	L									17													
Isopropylbenzene	140	L	25	L	21	L	77		27	L	33	290	L	21		23		96	J	29	L			
Methylcyclohexane	98		26		25		92		56		100	L	380		18		43		160					
Toluene (1,000,000/500,000)	470	L					61		17	L	39	20	L					30,000	L					
M +P -Xylene (1,000,000/67,000)*	15,000	L	120	L	17		2,200	L	20	L	350	110	L											
O-Xylene (1,000,000/67,000)*	3,800	L	59	L	30		600	L	22	L	160	L	61	L			14		85	J				
Benzene, 1,2,3-Trimethyl							660	NJ																
Benzene, 1-(1-Formylethyl)									410	NJ														
1-Buten-3-yne, 2-methyl																		230	NJ					
Cobalt, (2-Methyl-ETA-3-Propen							980	NJ																
Cyclohexane, 1,3-Dimethyl													460	NJ										
Cyclohexane, 1,2-Dimethyl															210	NJ	360	NJ	280	NJ				
Cyclohexane, Butyl			310	NJ	410	NJ					330	NJ												
Cyclohexane, Ethyl											220	NJ	510	NJ										
Cyclohexane, 1,1,3-trimethyl													410	NJ			190	NJ	530	NJ				
Cyclohexane, 1,2,3-Trimethyl															120	NJ	190	NJ						
Cyclohexane, 1,2,4-Trimethyl													390	NJ			230	NJ						
Cyclohexane, 1,3,5-Trimethyl															120	NJ			320	NJ				
Cyclohexane, 1-Ethyl-2-Methyl			290	NJ			490	NJ	420	NJ	300	NJ	590	NJ	240	NJ	410	NJ	290	NJ				
Cyclohexane, 1-Ethyl-3-Methyl																				160	NJ			
Cyclohexane, (2-Methylpropyl)	860	NJ					600	NJ	510	NJ														
Cyclohexanepropanol											320	NJ	440	NJ	190	NJ								
Cyclohexanone, 1,1,2,3-Tetramethyl											280	NJ	470	NJ	170	NJ	260	NJ						
Cyclopentane, 1,1,3-Trimethyl																	200	NJ	460	NJ				
Cyclopentane, 1,2,3-trimethyl																			390	NJ				
Cyclopentane, 1,2,4-trimethyl															130	NJ	280	NJ	740	NJ				
Cyclopentane, 1-ethyl-2-methyl			320	NJ																				
Decane, 4-Methyl	1,300	NJ	290	NJ	470	NJ	750	NJ			400	NJ	400	NJ							260	NJ		
Decane, 2,2,4-Trimethyl																				230	NJ			
Diisopropyl Ether											230	NJ			150	NJ					20	NJ	24	NJ
1-Ethyl-4-Methylcyclohexane													300	NJ										
Hexane, 2,2,5-Trimethyl							700/750	NJ	440	NJ														
Hexane, 2,2,4-Trimethyl																					280	NJ		
Hexane, 2,5-Dimethyl																			250	NJ				
Hexane, 2,4-Dimethyl																			280	NJ				
Hexadecane																					360	NJ		
Heptane, 2,2-Dimethyl																					210	NJ		
Heptane, 2,2,4,6,6-Pentamethyl							530	NJ																
1H-Indene, 2,3-Dihydro					890	NJ	730	NJ	1,300	NJ											370	NJ		
10H-Phenothiazin-3-OL, 2-Chloro																					260	NJ		
5-Nonadecen-1-ol															110	NJ								
Octane, 2-methyl	770	NJ																						
Octane, 2,3-dimethyl			250	NJ																				
Octane, 2,6-dimethyl					460	NJ			510	NJ														
Octane, 2,2,6-trimethyl					340	NJ															240	NJ		
Octane, 2,4,6-Trimethyl									640	NJ														
3-Octene, 4-ethyl			270	NJ																				
Sulfur Dioxide	2,700	NJ	1600	NJ	3,000	NJ	5,300	NJ	710	NJ	40/120	NJ			250	NJ			1,100	NJ			200	NJ
Sufurous Acid, Hexyl Pentadecyl																					200	NJ		
Undecane, 3,9-Dimethyl							1000	NJ																

Legend

- Sediment Sample Location
- ▨ BLDG
- Loading Dock
- ▭ UST
- Property Block 614

K = The identification of the analyte is acceptable; the reported value may be biased high
L = The identification of the analyte is acceptable; the reported value may be biased low
NJ = There is presumptive evidence that the analyte is present; the analyte is reported as a tentative identification. The reported value is an estimate
* criteria for total xylenes
(10,000,000/100,000) = (NRDCSCC/IGWSCC)
Bold = above criteria

U.S EPA Environmental Response Team
Scientific Engineering Response and Analytical Services
EP-W-09-031
W.A.# 0-089

Figure 5
VOC & SVOC Results In Sediment
29 Riverside Ave. (Phase 2 Assessment)
Newark, New Jersey



Map created using 2007 orthoimagery from NJGIN, site survey GPS data, sample results data.

Map Creation Date: 7 July 2011

Coordinate system: New Jersey State Plane
FIPS: 2900
Datum: NAD83
Units: Feet

Data: g:\arcviewprojects\SERAS01\00-089
MXD file: g:\arcinfo\projects\SERAS01\SER00089_RiversideNewark
089_DTM2011_VOC_SVOC_Results_inSedimentPorewater_f6

K = The identification of the analyte is acceptable; the reported value may be biased high.
L = The identification of the analyte is acceptable; the reported value may be biased low.
NJ = There is presumptive evidence that the analyte is present; the analyte is reported as a tentative identification. The reported value is an estimate.
(600) = NJDEP SGWQC where defined
Bold = above criteria

Volatile Organic Compounds in Sediment Porewater

Analyte	Concentration (µg/L)									
	SED-2	SED-5	SED-6	SED 6-7	SED-7	SED 7-8	SED 7-8D	SED-8	SED-9	SED-10
Acetone (600)	12	K								
Benzene (1)				6.2				41	7.1	
Cyclohexane				10						
Isopropylbenzene				30						
O-Xylene (1,000)								5.3		
1,3-Cyclopentadiene								11	NJ	
1-Butene-3-yne, 2-methyl				10	NJ					
Benzene, (1-methylpropyl)				8.2	NJ					
1-Propene, 2-methyl								20	NJ	
2,3-Butanedione								11	NJ	
4,7-Methano-1H-Indene			61	NJ	240	NJ	13	NJ	35	NJ
Cyclohexane, (2-methylpropyl)								95	NJ	
Cyclohexane, 1,1,3-Trimethyl								12	NJ	
Cyclohexanone, 3,3,5-Trimethyl			12	NJ						
Diisopropyl Ether		36	NJ	320	NJ	340	NJ	210	NJ	400
Diphenyl ether				8.5	NJ	400	NJ	410	NJ	1000
Ethyl Ether				16	NJ	14	NJ	24	NJ	25
Furan, Tetrahydro (10)								46	NJ	20
Indane				22	NJ			14	NJ	
Indan, 1-methyl				17	NJ					
Propane, 2-Ethoxy								13	NJ	
Propane, 2-Methoxy								30	NJ	
Sulfur Dioxide	270	NJ							18	NJ

Semivolatile Organic Compounds in Sediment Porewater

Analyte	Concentration (µg/L)									
	SED-2	SED-5	SED-6	SED 6-7	SED-7	SED 7-8	SED 7-8D	SED-8	SED-9	SED-10
Bis(2-Ethylhexyl)Phthalate (30)	20	5.4	5.4	30	27		25	29	52	13
4-Chloroaniline (30)								16		
Fluoranthene (300)							11			
Pyrene (200)							12			
Benzo(a)anthracene (0.1)							9.4			
Chrysene (5)							10			
Benzo(b)fluoranthene (0.2)							12			
Benzo(k)fluoranthene (0.5)							9.3			
Benzo(a)pyrene (0.1)							7.7			
Indeno(1,2,3-cd)pyrene (0.2)							6.2			
Benzo(g,h,i)perylene							6.4			
Naphthalene (300)								5.5		
Cyclohexanamine, N-Methyl			77	NJ	120	NJ	27	NJ		
Cyclohexanamine, N,N-Dimethyl				40	NJ		26	NJ	8.8	NJ
Cyclohexanone, 3,3,5-Trimethyl			32	NJ						
3,3-Dimethylheptanoic								24	NJ	
4,7-Methano-1H-Indene			37	NJ	140	NJ	11	NJ	27	NJ
Hexanoic Acid, 3,3,5-Trimethyl					10	NJ				
Hexanoic Acid, 3,5,5-Trimethyl							33	NJ		
Hexanoic Acid, Bis(2-Ethyl)		33	NJ							
O-Chloroaniline			18	NJ	69	NJ	26	NJ	87	NJ
Benzenamine, 2,3-Dimethyl					200	NJ				
3-Morpholino-1,2-Propanediol					12	NJ	26	NJ		
Diphenyl Ether					11	NJ				
M-Chloroaniline									43	NJ
Moclobemide										22
Phenol, 4-(1,1-Dimethylpropyl)										NJ
Phenol, 2,4,6-Trimethyl							39	NJ	25	NJ
Benzenamine, 2,3-dimethyl				820	NJ					
Benzenamine, 2,6-dimethyl				140	NJ					
Hexanoic acid, 3,4,4-trimethyl						41	NJ			
Phenol, 2,4,6-trimethyl						32	NJ			
Acetamide, n,n-dibutyl								13	NJ	
Benzenemethanamine, n,. Alpha								14	NJ	
Cyclotetrasiloxane	7	NJ								

U.S EPA Environmental Response Team
Scientific Engineering Response and Analytical Services
EP-W-09-031
W.A.# 0-089

Figure 6
VOC & SVOC Results In Sediment Porewater
29 Riverside Ave. (Phase 2 Assessment)
Newark, New Jersey



Analyte	Concentration (µg/kg)	
	B7-1	
Acetone (1,000,000/100,000)	1,200	
Benzene (13,000/1,000)	1,400	
2-Butanone (1,000,000/50,000)	1,000	
Carbon Disulfide	87	J
Chlorobenzene (680,000/1,000)	650	L
1,1-Dichloroethane (1,000,000/10,000)	140	J
1,1-Dichloroethene (150,000/10,000)	28	J
1,4-Dichlorobenzene (10,000,000/100,000)	2,100	J
1,2,4-Trichlorobenzene (1,200,000/100,000)	120	J
1,2,3-Trichlorobenzene	15	J
1,1,2-Trichloro-1,2,2-Trifluoroethane	22	J
1,1,1-Trichloroethane (1,000,000/50,000)	2,500	
Chloroform (28,000/1,000)	150	J
Cyclohexane	37	J
Ethylbenzene (1,000,000/100,000)	11,000	L
Isopropylbenzene	2,500	L
Methylene Chloride (210,000/1,000)	740	
Methylcyclohexane	120	J
4-Methyl-2-Pentanone	320	L
M+P-Xylene (1,000,000/67,000)*	11,000	L
O-Xylene (1,000,000/67,000)*	7,900	L
Styrene (97,000/100,000)	11,000	L
Trichloroethene (54,000/1,000)	34	J
Tetrachloroethene (6,000/1,000)	830	L
Toluene (1,000,000/500,000)	38,000	L
Benzene,1,2,3-Trimethyl	290	NJ
Cyclohexane, Ethyl	300	NJ
Cyclohexane,1,1,3-Trimethyl	300	NJ
Cyclohexane,1,2,4-Trimethyl	350	NJ
Cyclopentane, 1-Methyl-2-Propyl	350	NJ
2-Cyclohexen-1-One,4,5-Dimethyl	330	NJ
Diisopropyl Ether	820	NJ
Furan,2,3-Dihydro-4-(1-Methyl	240	NJ
Heptane, 2,6-Dimethyl	350	NJ
Propane, 1-Bromo-2-Methyl	320	NJ
Sulfur Dioxide	320	NJ

J = The identification of the analyte is acceptable; the reported value is an estimate.
K = The identification of the analyte is acceptable; the reported value may be biased high.
L = The identification of the analyte is acceptable; the reported value may be biased low.
NJ = There is presumptive evidence that the analyte is present; the analyte is reported as a tentative identification. The reported value is an estimate.

Analyte	Concentration (µg/kg)	
	B7-1	
Benzo(a)Anthracene (4,000/500,000)	2,200	
Benzo(a)Pyrene (660/100,000)	1,800	
Benzo(b)Fluoranthene (4,000/50,000)	2,600	
Bis(2-Ethylhexyl)Phthalate (210,000/100,000)	15,000	
Chrysene (40,000/500,000)	2,400	
4-Chloroaniline (42,000/not determined)	18,000	
Di-N-Octyl Phthalate	8,500	
Fluorene (10,000,000/100,000)	1,800	
Fluoranthene (10,000,000/100,000)	4,500	
Naphthalene (42000/100,000)	6,300	
2-Methyl Naphthalene	13,000	
Phenol	3,800	K
2-Methylphenol	14,000	K
4-Methylphenol	6,100	K
Pyrene (10,000,000/100,000)	3,800	
Phenanthrene	6,300	
O-Chloroaniline	3,700	NJ
N-Decanoic Acid	14,000	NJ
N-Hexadecanoic Acid	16,000	NJ
9-Octadecenoic Acid	4,700	NJ
Tetradecanoic Acid	4,200	NJ
Tetradecane	2,800	NJ
Hexadecane	2,900	NJ
Heptadecane	4,500	NJ
2-Propanol, 1-Chloro	9,200	NJ

Legend

▲

Sediment Water Sample Location

■

Water Sample Location

BLDG

Loading Dock

UST

Property Block 614

Map created using 2007 orthoimagery from NJGIN, site survey GPS data, sample results data.

Map Creation Date: 7 July 2011

Coordinate system: New Jersey State Plane
FIPS: 2900
Datum: NAD83
Units: Feet

Data: g:\arcviewprojects\SERAS01\00-089
MXD file: g:\arcinfo\projects\SERAS01\SER00089_RiversideNewark
\089_DTM2011_VOC_SVOC_Results_inSediment_fromBLDG7_f7

U.S EPA Environmental Response Team
Scientific Engineering Response and Analytical Services
EP-W-09-031
W.A.# 0-089

Figure 7
VOC & SVOC Results In Sediment From Building 7
29 Riverside Ave. (Phase 2 Assessment)
Newark, New Jersey





Analyte	Concentration µg/L							
	B7-1		B7-2		B7-3		B7-4	
Acetone (6000)					620	K	530	K
Benzene (1)	15	L	7.6	L	26		12	
2-Butanone	500	K	460	K	590	K	480	K
1,1-Dichloroethane (50)	59	L	37	L	76		37	
1,2-Dichlorobenzene (600)	13	J	15	J	19		11	
1,4-Dichlorobenzene (75)			6.5	J				
1,2,4-Trichlorobenzene (9)	51	J	62	J	49		34	
1,2,3-Trichlorobenzene	14	J	14	J	12		9.4	
1,1,1-Trichloroethane (30)	150	L	100	L	580		250	
Chlorobenzene (50)							21	
Chloroform (70)	78	L	46	L	210		76	
Cyclohexane					10		5.6	
Ethylbenzene (700)	130	J	100	J	95		84	
Isopropylbenzene	6	J	5.5	J	6			
Methylene Chloride (3)	940		560		1,000		600	
Methylcyclohexane	0.12	J			14		7.2	
4-Methyl-2-Pentanone	95	J	45	J	75		47	
m-P-Xylene (1000)*	43	J	31	J	190		77	
O-Xylene (1000)*	31	J	23	J	200		86	
Styrene (100)	27	J	19	J	65		25	
Trichloroethene (1)	6	L			75		24	
Tetrachloroethene (1)	7	J			49	J	15	J
Toluene (600)	180	J	110	J	910		530	
Benzene,1,2,3-Trimethyl	42	NJ	60	NJ	71	NJ	61	NJ
Benzene,1,2,4-Trimethyl	28	NJ						
Benzene,1,3,5-Trimethyl			72	NJ			48	NJ
Benzene,1-chloro-2-methyl					66	NJ		
Benzene,1-ethyl-3-methyl			60	NJ				
Benzene, bromo					220	NJ	71	NJ
Benzoic acid, butyl ester			45	NJ				
2-Butanol	33	NJ						
Cyclopentane, propyl					80	NJ	63	NJ
Diisopropyl Ether (20,000)	1400	NJ	750	NJ	1000	NJ	660	NJ
Dimethyl sulfide	88	NJ	110	NJ	140	NJ	79	NJ
Furan, tetrahydro (10)	170	NJ	79	NJ			54	NJ
Hydrogen chloride	150	NJ						
Isooctanol					110	NJ		
Naphthalene,1,2,3,4-tetrahydro					260	NJ	170	NJ
Naphthalene, 1-chloro							72	NJ
3-Octene							41	NJ
Pentane, 2-cyclopropyl					93	NJ		
Phenol, 2-methyl	37	NJ	55	NJ				
Propane, 1-Bromo-2-Methyl					63	NJ		
Sulfur Dioxide	38	NJ						


Analyte	Concentration µg/L							
	B7-1		B7-2		B7-3		B7-4	
Bis(2-Ethylhexyl)Phthalate (3)					64		30	K
2-Chloronaphthalene					180		120	
2,4-Dimethylphenol	290		150		790		320	
Diethylphthalate	61	K			150		69	K
Di-N-Octyl Phthalate			490				6.4	K
Naphthalene (300)							38	K
4-Nitrophenol	48	K						
2-Methyl Naphthalene	8.8	K	21	K	6.7	K	5.6	K
Phenol (2000)	3,000		1200		4,200		2,200	
2-Methylphenol	5,300		2,900		9,600		5,500	
4-Methylphenol	1,300		600		2,600		1,200	
Phenanthrene			19					
12-Benzenedicarboxylic Acid			18	NJ				
Benzenecarboxylic Acid							61	NJ
O-Chloroaniline	30	NJ			17	NJ		
1-Decanaminium, N,N,N-Trimethyl					35	NJ		
1-Hexadecanamine, N,N-Dimethyl							46	NJ
m-Chloroaniline			27	NJ				
4,7-Methano-1H-Indene	9	NJ			19	NJ		
p-Menth-1-en-8-ol	9.6	NJ						
Octadecylbenzyltrimethylammonium							36	NJ
Pentanoic Acid	11	NJ						
Phenol, 2,4,6-Trimethyl							33	NJ
Phosphoric Acid, Trioctyl Ester					65	NJ		
Phthalic Acid, 4-Octyl					16	NJ		
Phthalic Acid, Isobutyl 2-pen			46	NJ				
Phthalic Acid, Isohexyl			78	NJ				
Phthalic Acid, Nonyl 2-Pentyl			46	NJ				
Phthalic Acid, Decyl Nonyl			27	NJ				
Phenol, 2,3,5-Trimethyl	7.7	NJ						
Phenol, 2,4,6-Trimethyl			22	NJ				
Phosphoric Acid, Tris(2-ethylx)							67	NJ
2(1H)-Quinolone	7.9	NJ						
Tetradecane			22	NJ				
1-Tetradecanamine, N,N-Dimethyl							80	NJ
2,5,8,11-Tetraoxatetradecane							40	NJ
Undecane			22	NJ				


J = The identification of the analyte is acceptable; the reported value is an estimate.
K = The identification of the analyte is acceptable; the reported value may be biased high.
L = The identification of the analyte is acceptable; the reported value may be biased low.
NJ = There is presumptive evidence that the analyte is present; the analyte is reported as a tentative identification. The reported value is an estimate.


Legend


 Sediment Water Sample Location

 Water Sample Location

 BLDG

 Loading Dock

 UST

 Property Block 614

Map created using 2007 orthoimagery from NJGIN, site survey GPS data, sample results data.

Map Creation Date: 7 July 2011

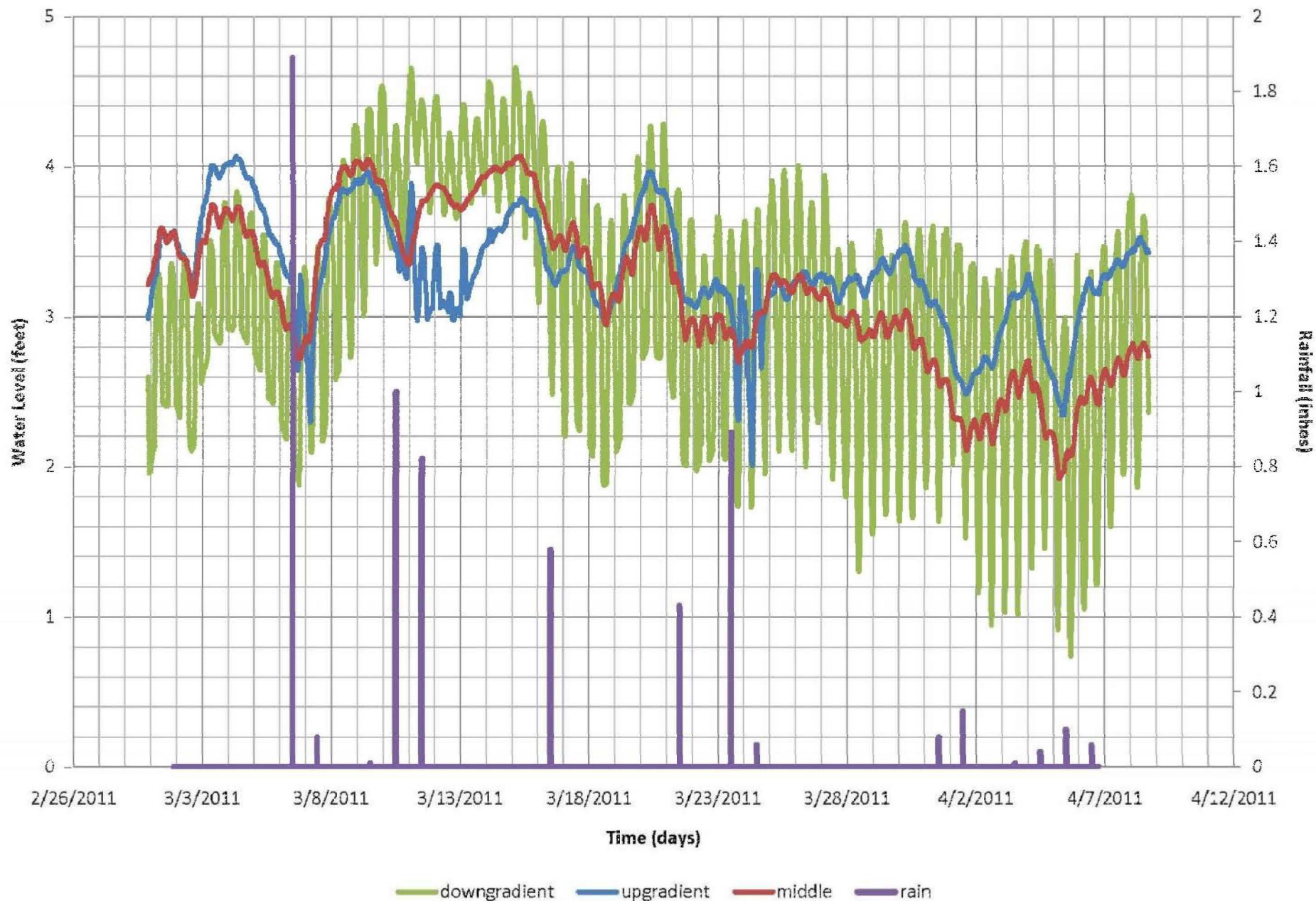
Coordinate system: New Jersey State Plane
FIPS: 2900
Datum: NAD83
Units: Feet

Data: g:\arcviewprojects\SERAS01\00-089
MXD file: g:\arcinfo\projects\SERAS01\SER00089_RiversideNewark
\089_DTM2011_VOC_SVOC_Results_inWater_FromBLDG7_f8



U.S EPA Environmental Response Team
Scientific Engineering Response and Analytical Services
EP-W-09-031
W.A.# 0-089

Figure 8
VOC & SVOC Results In Water From Building 7
29 Riverside Ave. (Phase 2 Assessment)
Newark, New Jersey



U.S. EPA Environmental Response Team
 Scientific Engineering Response and Analytical Services
 EP-W-09-031
 W.A.# 0 -089

Figure 9
 Water Levels in Wells -
 Riverside Avenue Site
 29 Riverside Ave (Phase 2 Assessment)
 Newark, New Jersey

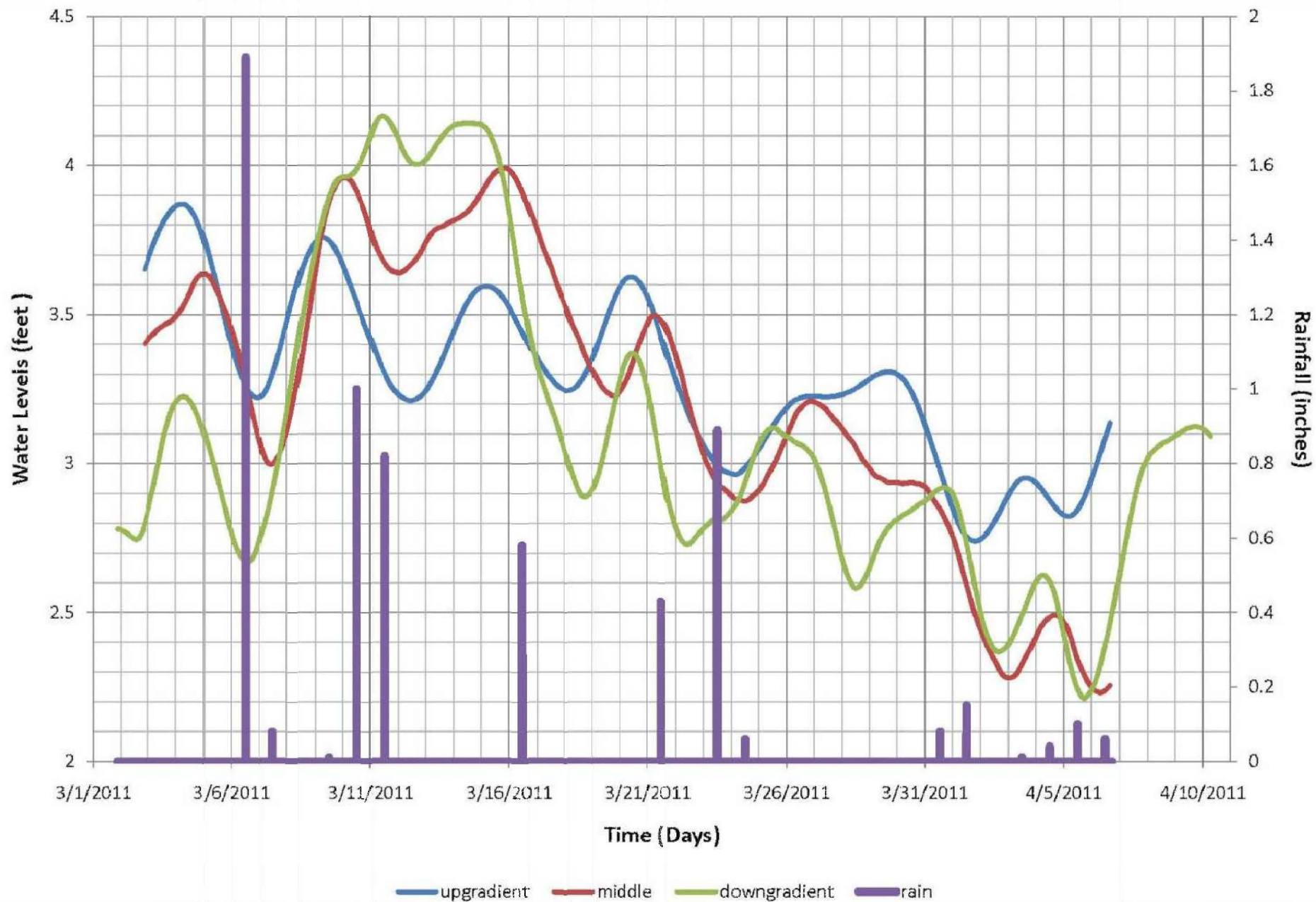


Figure 10
Time-Weighted Filter of Water Levels -
Riverside Avenue Site
29 Riverside Ave (Phase 2 Assessment)
Newark, New Jersey

U.S. EPA Environmental Response Team
Scientific Engineering Response and Analytical Services
EP-W-09-031
W.A.# 0 -089

APPENDIX E: PROUCL ASSUMPTIONS AND STATISTICAL OUTPUT

Shallow Sediment (0-2.5')**Nonparametric Oneway ANOVA (Kruskal-Wallis Test)**

Date/Time of Computation ProUCL 5.19/7/2016 10:44:06 AM
 From File ProUCL_data_RIP-Adjacent.xls
 Full Precision OFF

2,3,7,8-TCDD

Group	Obs	Median	Ave Rank	Z
down	93		0.572	126.8
site	27		0.37	103.9
up	90		0.112	84.01
Overall	210		0.374	105.5

K-W (H-Stat)	DOF	P-Value	(Approx. Chisquare)
22.67	2	1.20E-05	
22.67	2	1.20E-05	(Adjusted for Ties)

Note: A p-value ≤ 0.05 (or some other selected level) suggests that there are significant differences in mean/median characteristics of the various groups at 0.05 or other selected level of significance

A p-value > 0.05 (or other selected level) suggests that mean/median characteristics of the various groups are comparable.

Shallow Sediment (0-2.5')**Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects**

User Selected Options

Date/Time of Computation	ProUCL 5.19/7/2016 10:45:10 AM
From File	ProUCL_data_RIP-Adjacent.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median = Sample 2 Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Sample 1 Mean/Median <> Sample 2 Mean/Median

Sample 1 Data: 2,3,7,8-TCDD(down)

Sample 2 Data: 2,3,7,8-TCDD(site)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	93	27
Number of Non-Detects	0	0
Number of Detect Data	93	27
Minimum Non-Detect	N/A	N/A
Maximum Non-Detect	N/A	N/A
Percent Non-detects	0.00%	0.00%
Minimum Detect	0.0187	4.40E-04
Maximum Detect	36	32
Mean of Detects	2.868	1.737
Median of Detects	0.572	0.37
SD of Detects	6.392	6.106
KM Mean	2.868	1.737
KM SD	6.392	6.106

Sample 1 vs Sample 2 Gehan Test

H0: Mean of Sample 1 = Mean of background

Gehan z Test Value	2.033
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.042

Conclusion with Alpha = 0.05

Reject H0, Conclude Sample 1 <> Sample 2

P-Value < alpha (0.05)

Shallow Sediment (0-2.5')**Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects**

User Selected Options

Date/Time of Computation	ProUCL 5.19/7/2016 10:46:17 AM
From File	ProUCL_data_RIP-Adjacent.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median = Sample 2 Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Sample 1 Mean/Median <> Sample 2 Mean/Median

Sample 1 Data: 2,3,7,8-TCDD(site)

Sample 2 Data: 2,3,7,8-TCDD(up)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	27	90
Number of Non-Detects	0	7
Number of Detect Data	27	83
Minimum Non-Detect	N/A	1.90E-04
Maximum Non-Detect	N/A	0.015
Percent Non-detects	0.00%	7.78%
Minimum Detect	4.40E-04	2.48E-04
Maximum Detect	32	34.1
Mean of Detects	1.737	3.302
Median of Detects	0.37	0.142
SD of Detects	6.106	7.382
KM Mean	1.737	3.046
KM SD	6.106	7.101

Sample 1 vs Sample 2 Gehan Test

H0: Mean of Sample 1 = Mean of background

Gehan z Test Value	1.815
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.0695

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Sample 1 = Sample 2

P-Value >= alpha (0.05)

Shallow Sediment (0-2.5')**Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects**

User Selected Options

Date/Time of Computation	ProUCL 5.18/23/2016 1:58:40 PM
From File	PUCL_shal_08232016.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median = Sample 2 Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Sample 1 Mean/Median <> Sample 2 Mean/Median

Sample 1 Data: 2,3,7,8-TCDD(down)

Sample 2 Data: 2,3,7,8-TCDD(up)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	93	90
Number of Non-Detects	0	7
Number of Detect Data	93	83
Minimum Non-Detect	N/A	1.90E-04
Maximum Non-Detect	N/A	0.015
Percent Non-detects	0.00%	7.78%
Minimum Detect	0.0187	2.48E-04
Maximum Detect	36	34.1
Mean of Detects	2.868	3.302
Median of Detects	0.572	0.142
SD of Detects	6.392	7.382
KM Mean	2.868	3.046
KM SD	6.392	7.101

Sample 1 vs Sample 2 Gehan Test

H0: Mean of Sample 1 = Mean of background

Gehan z Test Value	4.606
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	4.10E-06

Conclusion with Alpha = 0.05

Reject H0, Conclude Sample 1 <> Sample 2

P-Value < alpha (0.05)

Deep Sediment (2.5'-6')**Nonparametric Oneway ANOVA (Kruskal-Wallis Test)**

Date/Time of Computation ProUCL 5.19/7/2016 11:05:01 AM
 From File ProUCL_data_RIP-Adjacent_a.xls
 Full Precision OFF

2,3,7,8-TCDD

Group	Obs	Median	Ave Rank	Z
down	44	1.27	34.2	3.761
site	3	0.031	23.33	-0.65
up	11	0.00165	12.36	-3.739
Overall	58	0.57	29.5	

K-W (H-Stat)	DOF	P-Value	(Approx. Chisquare)
15.14	2	5.15E-04	
15.14	2	5.15E-04	(Adjusted for Ties)

Note: A p-value ≤ 0.05 (or some other selected level) suggests that there are significant differences in mean/median characteristics of the various groups at 0.05 or other selected level of significance

A p-value > 0.05 (or other selected level) suggests that mean/median characteristics of the various groups are comparable.

Deep Sediment (2.5'-6')**Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects**

User Selected Options

Date/Time of Computation	ProUCL 5.19/7/2016 11:05:35 AM
From File	ProUCL_data_RIP-Adjacent_a.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median = Sample 2 Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Sample 1 Mean/Median <> Sample 2 Mean/Median

Sample 1 Data: 2,3,7,8-TCDD(down)

Sample 2 Data: 2,3,7,8-TCDD(site)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	44	3
Number of Non-Detects	6	0
Number of Detect Data	38	3
Minimum Non-Detect	6.10E-04	N/A
Maximum Non-Detect	0.0025	N/A
Percent Non-detects	13.64%	0.00%
Minimum Detect	0.00213	5.60E-04
Maximum Detect	48.9	4.5
Mean of Detects	5.636	1.511
Median of Detects	1.385	0.031
SD of Detects	9.448	2.589
KM Mean	4.867	1.511
KM SD	8.877	2.589

Sample 1 vs Sample 2 Gehan Test

H0: Mean of Sample 1 = Mean of background

Gehan z Test Value	1.003
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.316

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Sample 1 = Sample 2

P-Value >= alpha (0.05)

Deep Sediment (2.5'-6')**Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects**

User Selected Options

Date/Time of Computation	ProUCL 5.19/7/2016 11:06:02 AM
From File	ProUCL_data_RIP-Adjacent_a.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median = Sample 2 Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Sample 1 Mean/Median <> Sample 2 Mean/Median

Sample 1 Data: 2,3,7,8-TCDD(site)

Sample 2 Data: 2,3,7,8-TCDD(up)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	3	11
Number of Non-Detects	0	4
Number of Detect Data	3	7
Minimum Non-Detect	N/A	1.78E-04
Maximum Non-Detect	N/A	3.53E-04
Percent Non-detects	0.00%	36.36%
Minimum Detect	5.60E-04	5.57E-04
Maximum Detect	4.5	0.597
Mean of Detects	1.511	0.119
Median of Detects	0.031	0.00679
SD of Detects	2.589	0.217
KM Mean	1.511	0.0756
KM SD	2.589	0.17

Sample 1 vs Sample 2 Gehan Test

H0: Mean of Sample 1 = Mean of background

Gehan z Test Value	1.181
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.238

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Sample 1 = Sample 2

P-Value >= alpha (0.05)

Deep Sediment (2.5'-6')**Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects**

User Selected Options

Date/Time of Computation	ProUCL 5.18/23/2016 4:00:51 PM
From File	PUCL_deep_08232016.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median = Sample 2 Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Sample 1 Mean/Median <> Sample 2 Mean/Median

Sample 1 Data: 2,3,7,8-TCDD(down)

Sample 2 Data: 2,3,7,8-TCDD(up)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	44	11
Number of Non-Detects	6	4
Number of Detect Data	38	7
Minimum Non-Detect	6.10E-04	1.78E-04
Maximum Non-Detect	0.0025	3.53E-04
Percent Non-detects	13.64%	36.36%
Minimum Detect	0.00213	5.57E-04
Maximum Detect	48.9	0.597
Mean of Detects	5.636	0.119
Median of Detects	1.385	0.00679
SD of Detects	9.448	0.217
KM Mean	4.867	0.0756
KM SD	8.877	0.17

Sample 1 vs Sample 2 Gehan Test

H0: Mean of Sample 1 = Mean of background

Gehan z Test Value	3.497
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96E+00
P-Value	4.70E-04

Conclusion with Alpha = 0.05

Reject H0, Conclude Sample 1 <> Sample 2

P-Value < alpha (0.05)

Shallow Sediment (0-2.5')**Nonparametric Oneway ANOVA (Kruskal-Wallis Test)**

Date/Time of Computation	ProUCL 5.19/7/2016 11:24:04 AM
From File	ProUCL_data_RIP-Adjacent.xls
Full Precision	OFF

PCBTotall

Group	Obs	Median	Ave Rank	Z
down	94	1665	128.4	5.937
site	26	487.5	74.83	-2.526
up	83	462	80.66	-4.305
Overall	203	1010	102	

K-W (H-Stat)	DOF	P-Value	(Approx. Chisquare)
35.45	2	2.01E-08	
35.45	2	2.01E-08	(Adjusted for Ties)

Note: A p-value ≤ 0.05 (or some other selected level) suggests that there are significant differences in mean/median characteristics of the various groups at 0.05 or other selected level of significance

A p-value > 0.05 (or other selected level) suggests that mean/median characteristics of the various groups are comparable.

Shallow Sediment (0-2.5')**Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects**

User Selected Options

Date/Time of Computation	ProUCL 5.19/7/2016 11:25:06 AM
From File	ProUCL_data_RIP-Adjacent.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median = Sample 2 Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Sample 1 Mean/Median \neq Sample 2 Mean/Median

Sample 1 Data: PCBTot(dn)

Sample 2 Data: PCBTot(site)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	94	26
Number of Non-Detects	3	13
Number of Detect Data	91	13
Minimum Non-Detect	6.5	66
Maximum Non-Detect	1240	254
Percent Non-detects	3.19%	50.00%
Minimum Detect	73	721
Maximum Detect	28600	7740
Mean of Detects	3010	1798
Median of Detects	1680	1100
SD of Detects	4079	1927
KM Mean	2922	931.8
KM SD	4020	1570

Sample 1 vs Sample 2 Gehan Test

H0: Mean of Sample 1 = Mean of background

Gehan z Test Value	4.458
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	8.28E-06

Conclusion with Alpha = 0.05

Reject H0, Conclude Sample 1 \neq Sample 2

P-Value < alpha (0.05)

Shallow Sediment (0-2.5')**Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects**

User Selected Options

Date/Time of Computation	ProUCL 5.19/7/2016 11:25:31 AM
From File	ProUCL_data_RIP-Adjacent.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median = Sample 2 Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Sample 1 Mean/Median <> Sample 2 Mean/Median

Sample 1 Data: PCBTotals(site)

Sample 2 Data: PCBTotals(up)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	26	83
Number of Non-Detects	13	3
Number of Detect Data	13	80
Minimum Non-Detect	66	0.0317
Maximum Non-Detect	254	0.856
Percent Non-detects	50.00%	3.61%
Minimum Detect	721	0.0179
Maximum Detect	7740	41800
Mean of Detects	1798	2658
Median of Detects	1100	497.5
SD of Detects	1927	6300
KM Mean	931.8	2561
KM SD	1570	6166

Sample 1 vs Sample 2 Gehan Test

H0: Mean of Sample 1 = Mean of background

Gehan z Test Value	-1.175
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.24

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Sample 1 = Sample 2

P-Value >= alpha (0.05)

Shallow Sediment (0-2.5')**Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects**

User Selected Options

Date/Time of Computation	ProUCL 5.18/31/2016 12:51:26 PM
From File	SD_PCB_ProUCL_data Shallow.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median = Sample 2 Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Sample 1 Mean/Median \neq Sample 2 Mean/Median

Sample 1 Data: PCBSum(down)

Sample 2 Data: PCBSum(up)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	94	83
Number of Non-Detects	3	3
Number of Detect Data	91	80
Minimum Non-Detect	6.5	0.0317
Maximum Non-Detect	1240	0.856
Percent Non-detects	3.19%	3.61%
Minimum Detect	73	0.0179
Maximum Detect	28600	41800
Mean of Detects	3010	2658
Median of Detects	1680	497.5
SD of Detects	4079	6300
KM Mean	2922	2561
KM SD	4020	6166

Sample 1 vs Sample 2 Gehan Test

H0: Mean of Sample 1 = Mean of background

Gehan z Test Value	5.141
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	2.73E-07

Conclusion with Alpha = 0.05

Reject H0, Conclude Sample 1 \neq Sample 2

P-Value < alpha (0.05)

Deep Sediment (2.5'-6')**Nonparametric Oneway ANOVA (Kruskal-Wallis Test)**

Date/Time of Computation ProUCL 5.19/7/2016 11:06:33 AM
 From File ProUCL_data_RIP-Adjacent_a.xls
 Full Precision OFF

PCBTTotal

Group	Obs	Median	Ave Rank	Z
down	43	908	31.98	2.901
site	3	94.3	27	-0.164
up	10	2.295	14	-3.102
Overall	56	365.5	28.5	

K-W (H-Stat)	DOF	P-Value	(Approx. Chisquare)
9.884	2	7.14E-03	
9.884	2	7.14E-03	(Adjusted for Ties)

Note: A p-value ≤ 0.05 (or some other selected level) suggests that there are significant differences in mean/median characteristics of the various groups at 0.05 or other selected level of significance
 A p-value > 0.05 (or other selected level) suggests that mean/median characteristics of the various groups are comparable.

Deep Sediment (2.5'-6')**Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects**

User Selected Options

Date/Time of Computation	ProUCL 5.19/7/2016 11:07:01 AM
From File	ProUCL_data_RIP-Adjacent_a.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median = Sample 2 Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Sample 1 Mean/Median <> Sample 2 Mean/Median

Sample 1 Data: PCBTot(dn)

Sample 2 Data: PCBTot(site)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	43	3
Number of Non-Detects	17	2
Number of Detect Data	26	1
Minimum Non-Detect	4.8	86.9
Maximum Non-Detect	1360	94.3
Percent Non-detects	39.53%	66.67%
Minimum Detect	105	7770
Maximum Detect	18800	7770
Mean of Detects	4360	7770
Median of Detects	2510	7770
SD of Detects	4832	N/A
KM Mean	2647	2648
KM SD	4251	3622

Sample 1 vs Sample 2 Gehan Test

H0: Mean of Sample 1 = Mean of background

Gehan z Test Value	0.397
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.691

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Sample 1 = Sample 2

P-Value >= alpha (0.05)

Deep Sediment (2.5'-6')**Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects**

User Selected Options

Date/Time of Computation	ProUCL 5.19/7/2016 11:07:37 AM
From File	ProUCL_data_RIP-Adjacent_a.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median = Sample 2 Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Sample 1 Mean/Median <> Sample 2 Mean/Median

Sample 1 Data: PCBTotals(site)

Sample 2 Data: PCBTotals(up)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	3	10
Number of Non-Detects	2	3
Number of Detect Data	1	7
Minimum Non-Detect	86.9	0.554
Maximum Non-Detect	94.3	0.673
Percent Non-detects	66.67%	30.00%
Minimum Detect	7770	0.116
Maximum Detect	7770	1600
Mean of Detects	7770	384.4
Median of Detects	7770	108
SD of Detects	N/A	582.5
KM Mean	2648	269.1
KM SD	3622	484.4

Sample 1 vs Sample 2 Gehan Test

H0: Mean of Sample 1 = Mean of background

Gehan z Test Value	0.185
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.853

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Sample 1 = Sample 2

P-Value >= alpha (0.05)

Deep Sediment (2.5'-6')**Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects**

User Selected Options

Date/Time of Computation	ProUCL 5.18/31/2016 12:54:55 PM
From File	SD_PCB_ProUCL_data Deep.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median = Sample 2 Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Sample 1 Mean/Median <> Sample 2 Mean/Median

Sample 1 Data: PCBSum(down)

Sample 2 Data: PCBSum(up)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	43	10
Number of Non-Detects	17	3
Number of Detect Data	26	7
Minimum Non-Detect	4.8	0.554
Maximum Non-Detect	1360	0.673
Percent Non-detects	39.53%	30.00%
Minimum Detect	105	0.116
Maximum Detect	18800	1600
Mean of Detects	4360	384.4
Median of Detects	2510	108
SD of Detects	4832	582.5
KM Mean	2647	269.1
KM SD	4251	484.4

Sample 1 vs Sample 2 Gehan Test

H0: Mean of Sample 1 = Mean of background

Gehan z Test Value	1.965
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96E+00
P-Value	4.94E-02

Conclusion with Alpha = 0.05

Reject H0, Conclude Sample 1 <> Sample 2

P-Value < alpha (0.05)

Shallow Sediment (0-2.5')

Nonparametric Oneway ANOVA (Kruskal-Wallis Test)

Date/Time of Computation ProUCL 5.19/7/2016 10:54:23 AM
From File ProUCL_data_RIP-Adjacent.xls
Full Precision OFF

PESTSum

Group	Obs	Median	Ave Rank	Z
down	101	172.3	116.7	4.163
site	26	105.5	72.67	-2.595
up	72	118.3	86.38	-2.512
Overall	199	140	100	

K-W (H-Stat)	DOF	P-Value	(Approx. Chisquare)
18.42	2	1.00E-04	
18.42	2	1.00E-04	(Adjusted for Ties)

Note: A p-value ≤ 0.05 (or some other selected level) suggests that there are significant differences in mean/median characteristics of the various groups at 0.05 or other selected level of significance

A p-value > 0.05 (or other selected level) suggests that mean/median characteristics of the various groups are comparable.

Shallow Sediment (0-2.5')

Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.19/7/2016 10:54:54 AM
From File	ProUCL_data_RIP-Adjacent.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median = Sample 2 Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Sample 1 Mean/Median \neq Sample 2 Mean/Median

Sample 1 Data: PESTSum(down)

Sample 2 Data: PESTSum(site)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	101	26
Number of Non-Detects	1	1
Number of Detect Data	100	25
Minimum Non-Detect	332	3.85
Maximum Non-Detect	332	3.85
Percent Non-detects	0.99%	3.85%
Minimum Detect	11.37	39
Maximum Detect	3097	1263
Mean of Detects	401.9	165.1
Median of Detects	169.3	107
SD of Detects	565.5	238
KM Mean	399.5	158.9
KM SD	560.4	230.8

Sample 1 vs Sample 2 Gehan Test

H0: Mean of Sample 1 = Mean of background

Gehan z Test Value	3.926
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	8.63E-05

Conclusion with Alpha = 0.05

Reject H0, Conclude Sample 1 \neq Sample 2

P-Value < alpha (0.05)

Shallow Sediment (0-2.5')

Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.19/7/2016 10:55:33 AM
From File	ProUCL_data_RIP-Adjacent.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median = Sample 2 Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Sample 1 Mean/Median <> Sample 2 Mean/Median

Sample 1 Data: PESTSum(site)

Sample 2 Data: PESTSum(up)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	26	72
Number of Non-Detects	1	0
Number of Detect Data	25	72
Minimum Non-Detect	3.85	N/A
Maximum Non-Detect	3.85	N/A
Percent Non-detects	3.85%	0.00%
Minimum Detect	39	0.515
Maximum Detect	1263	2449
Mean of Detects	165.1	289.9
Median of Detects	107	118.3
SD of Detects	238	438.5
KM Mean	158.9	289.9
KM SD	230.8	438.5

Sample 1 vs Sample 2 Gehan Test

H0: Mean of Sample 1 = Mean of background

Gehan z Test Value	-0.39
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.696

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Sample 1 = Sample 2

P-Value >= alpha (0.05)

Shallow Sediment (0-2.5')

Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.18/30/2016 2:23:14 PM
From File	SD_Pest_ProUCL_data.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median = Sample 2 Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Sample 1 Mean/Median \neq Sample 2 Mean/Median

Sample 1 Data: PesticideSum(down)

Sample 2 Data: PesticideSum(up)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	101	72
Number of Non-Detects	1	0
Number of Detect Data	100	72
Minimum Non-Detect	140	N/A
Maximum Non-Detect	140	N/A
Percent Non-detects	0.99%	0.00%
Minimum Detect	11.37	0.515
Maximum Detect	3097	2449
Mean of Detects	403.8	289.9
Median of Detects	174.9	118.3
SD of Detects	564.9	438.5
KM Mean	400.9	289.9
KM SD	560.1	438.5

Sample 1 vs Sample 2 Gehan Test

H0: Mean of Sample 1 = Mean of background

Gehan z Test Value	3.101
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.00193

Conclusion with Alpha = 0.05

Reject H0, Conclude Sample 1 \neq Sample 2

P-Value < alpha (0.05)

Deep Sediment (2.5'-6')

Nonparametric Oneway ANOVA (Kruskal-Wallis Test)

Date/Time of Computation ProUCL 5.19/7/2016 11:08:01 AM
From File ProUCL_data_RIP-Adjacent_a.xls
Full Precision OFF

PESTSum

Group	Obs	Median	Ave Rank	Z
down	47	457.5	35.23	3.992
site	3	4.67	21	-0.967
up	10	3.053	11.1	-3.848
Overall	60	264.9	30.5	

K-W (H-Stat)	DOF	P-Value	(Approx. Chisquare)
16.68	2	2.39E-04	
16.68	2	2.39E-04	(Adjusted for Ties)

Note: A p-value ≤ 0.05 (or some other selected level) suggests that there are significant differences in mean/median characteristics of the various groups at 0.05 or other selected level of significance

A p-value > 0.05 (or other selected level) suggests that mean/median characteristics of the various groups are comparable.

Deep Sediment (2.5'-6')

Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.19/7/2016 11:08:29 AM
From File	ProUCL_data_RIP-Adjacent_a.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median = Sample 2 Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Sample 1 Mean/Median <> Sample 2 Mean/Median

Sample 1 Data: PESTSum(down)

Sample 2 Data: PESTSum(site)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	47	3
Number of Non-Detects	6	1
Number of Detect Data	41	2
Minimum Non-Detect	3.92	4.64
Maximum Non-Detect	5.1	4.64
Percent Non-detects	12.77%	33.33%
Minimum Detect	51.5	4.67
Maximum Detect	4256	507
Mean of Detects	858.2	255.8
Median of Detects	480	255.8
SD of Detects	946.4	355.2
KM Mean	749.2	172.1
KM SD	918.5	236.8

Sample 1 vs Sample 2 Gehan Test

H0: Mean of Sample 1 = Mean of background

Gehan z Test Value	1.432
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.152

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Sample 1 = Sample 2

P-Value >= alpha (0.05)

Deep Sediment (2.5'-6')

Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.19/7/2016 11:08:56 AM
From File	ProUCL_data_RIP-Adjacent_a.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median = Sample 2 Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Sample 1 Mean/Median <> Sample 2 Mean/Median

Sample 1 Data: PESTSum(site)

Sample 2 Data: PESTSum(up)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	3	10
Number of Non-Detects	1	2
Number of Detect Data	2	8
Minimum Non-Detect	4.64	0.078
Maximum Non-Detect	4.64	5.7
Percent Non-detects	33.33%	20.00%
Minimum Detect	4.67	0.0188
Maximum Detect	507	260.4
Mean of Detects	255.8	63
Median of Detects	255.8	14.9
SD of Detects	355.2	96.36
KM Mean	172.1	50.42
KM SD	236.8	84.45

Sample 1 vs Sample 2 Gehan Test

H0: Mean of Sample 1 = Mean of background

Gehan z Test Value	0.633
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.527

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Sample 1 = Sample 2

P-Value >= alpha (0.05)

Deep Sediment (2.5'-6')

Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.18/30/2016 2:31:45 PM
From File	SD_Pest_ProUCL_data_deep.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median = Sample 2 Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Sample 1 Mean/Median \neq Sample 2 Mean/Median

Sample 1 Data: PesticideSum(down)

Sample 2 Data: PesticideSum(up)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	47	10
Number of Non-Detects	6	2
Number of Detect Data	41	8
Minimum Non-Detect	3.92	0.078
Maximum Non-Detect	5.1	5.7
Percent Non-detects	12.77%	20.00%
Minimum Detect	51.5	0.0188
Maximum Detect	4256	260.4
Mean of Detects	858.2	63
Median of Detects	480	14.9
SD of Detects	946.4	96.36
KM Mean	749.2	50.42
KM SD	918.5	84.45

Sample 1 vs Sample 2 Gehan Test

H0: Mean of Sample 1 = Mean of background

Gehan z Test Value	3.73
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	1.92E-04

Conclusion with Alpha = 0.05

Reject H0, Conclude Sample 1 \neq Sample 2

P-Value < alpha (0.05)

Shallow Sediment (0-2.5')**Nonparametric Oneway ANOVA (Kruskal-Wallis Test)**

Date/Time of Computation	ProUCL 5.19/7/2016 10:56:16 AM
From File	ProUCL_data_RIP-Adjacent.xls
Full Precision	OFF

Mercury

Group	Obs	Median	Ave Rank	Z
down	94	2885	117.3	2.058
site	34	2800	118.7	1.149
up	86	1550	92.32	-2.94
Overall	214	2600	107.5	

K-W (H-Stat)	DOF	P-Value	(Approx. Chisquare)
8.653	2	0.0132	
8.654	2	0.0132	(Adjusted for Ties)

Note: A p-value ≤ 0.05 (or some other selected level) suggests that there are significant differences in mean/median characteristics of the various groups at 0.05 or other selected level of significance

A p-value > 0.05 (or other selected level) suggests that mean/median characteristics of the various groups are comparable.

Shallow Sediment (0-2.5')**Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects**

User Selected Options

Date/Time of Computation	ProUCL 5.19/7/2016 10:56:59 AM
From File	ProUCL_data_RIP-Adjacent.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median = Sample 2 Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Sample 1 Mean/Median \neq Sample 2 Mean/Median

Sample 1 Data: Mercury(down)

Sample 2 Data: Mercury(site)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	94	34
Number of Non-Detects	0	0
Number of Detect Data	94	34
Minimum Non-Detect	N/A	N/A
Maximum Non-Detect	N/A	N/A
Percent Non-detects	0.00%	0.00%
Minimum Detect	256	120
Maximum Detect	15800	16300
Mean of Detects	3900	3885
Median of Detects	2885	2800
SD of Detects	3356	3405
KM Mean	3900	3885
KM SD	3356	3405

Sample 1 vs Sample 2 Gehan Test

H0: Mean of Sample 1 = Mean of background

Gehan z Test Value	-0.275
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.783

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Sample 1 = Sample 2

P-Value \geq alpha (0.05)

Shallow Sediment (0-2.5')**Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects**

User Selected Options

Date/Time of Computation	ProUCL 5.19/7/2016 11:01:25 AM
From File	ProUCL_data_RIP-Adjacent.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median = Sample 2 Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Sample 1 Mean/Median <> Sample 2 Mean/Median

Sample 1 Data: Mercury(site)

Sample 2 Data: Mercury(up)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	34	86
Number of Non-Detects	0	0
Number of Detect Data	34	86
Minimum Non-Detect	N/A	N/A
Maximum Non-Detect	N/A	N/A
Percent Non-detects	0.00%	0.00%
Minimum Detect	120	5.17
Maximum Detect	16300	26900
Mean of Detects	3885	4166
Median of Detects	2800	1550
SD of Detects	3405	5947
KM Mean	3885	4166
KM SD	3405	5947

Sample 1 vs Sample 2 Gehan Test

H0: Mean of Sample 1 = Mean of background

Gehan z Test Value	1.934
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.0532

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Sample 1 = Sample 2

P-Value >= alpha (0.05)

Shallow Sediment (0-2.5')**Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects**

User Selected Options

Date/Time of Computation	ProUCL 5.18/23/2016 2:51:32 PM
From File	PUCL_shal_08232016.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median = Sample 2 Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Sample 1 Mean/Median \neq Sample 2 Mean/Median

Sample 1 Data: Mercury(down)

Sample 2 Data: Mercury(up)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	94	86
Number of Non-Detects	0	0
Number of Detect Data	94	86
Minimum Non-Detect	N/A	N/A
Maximum Non-Detect	N/A	N/A
Percent Non-detects	0.00%	0.00%
Minimum Detect	256	5.17
Maximum Detect	15800	26900
Mean of Detects	3900	4166
Median of Detects	2885	1550
SD of Detects	3356	5947
KM Mean	3900	4166
KM SD	3356	5947

Sample 1 vs Sample 2 Gehan Test

H0: Mean of Sample 1 = Mean of background

Gehan z Test Value	2.738
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.00619

Conclusion with Alpha = 0.05

Reject H0, Conclude Sample 1 \neq Sample 2

P-Value < alpha (0.05)

Deep Sediment (2.5'-6')**Nonparametric Oneway ANOVA (Kruskal-Wallis Test)**

Date/Time of Computation	ProUCL 5.19/7/2016 11:09:42 AM
From File	ProUCL_data_RIP-Adjacent_a.xls
Full Precision	OFF

Mercury

Group	Obs	Median	Ave Rank	Z
down	45	6200	34.82	3.32
site	4	3450	24.38	-0.726
up	11	425	15.05	-3.248
Overall	60	5235	30.5	

K-W (H-Stat)	DOF	P-Value	(Approx. Chisquare)
11.86	2	0.00266	
11.87	2	0.00265	(Adjusted for Ties)

Note: A p-value ≤ 0.05 (or some other selected level) suggests that there are significant differences in mean/median characteristics of the various groups at 0.05 or other selected level of significance

A p-value > 0.05 (or other selected level) suggests that mean/median characteristics of the various groups are comparable.

Deep Sediment (2.5'-6')**Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects**

User Selected Options

Date/Time of Computation	ProUCL 5.19/7/2016 11:11:24 AM
From File	ProUCL_data_RIP-Adjacent_a.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median = Sample 2 Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Sample 1 Mean/Median <> Sample 2 Mean/Median

Sample 1 Data: Mercury(down)

Sample 2 Data: Mercury(site)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	45	4
Number of Non-Detects	3	0
Number of Detect Data	42	4
Minimum Non-Detect	110	N/A
Maximum Non-Detect	120	N/A
Percent Non-detects	6.67%	0.00%
Minimum Detect	120	1500
Maximum Detect	22600	8800
Mean of Detects	8229	4300
Median of Detects	6870	3450
SD of Detects	5786	3275
KM Mean	7688	4300
KM SD	5883	3275

Sample 1 vs Sample 2 Gehan Test

H0: Mean of Sample 1 = Mean of background

Gehan z Test Value	1.315
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.189

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Sample 1 = Sample 2

P-Value >= alpha (0.05)

Deep Sediment (2.5'-6')**Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects**

User Selected Options

Date/Time of Computation	ProUCL 5.19/7/2016 11:11:52 AM
From File	ProUCL_data_RIP-Adjacent_a.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median = Sample 2 Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Sample 1 Mean/Median \neq Sample 2 Mean/Median

Sample 1 Data: Mercury(site)

Sample 2 Data: Mercury(up)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	4	11
Number of Non-Detects	0	0
Number of Detect Data	4	11
Minimum Non-Detect	N/A	N/A
Maximum Non-Detect	N/A	N/A
Percent Non-detects	0.00%	0.00%
Minimum Detect	1500	12.3
Maximum Detect	8800	9570
Mean of Detects	4300	2181
Median of Detects	3450	425
SD of Detects	3275	3289
KM Mean	4300	2181
KM SD	3275	3289

Sample 1 vs Sample 2 Gehan Test

H0: Mean of Sample 1 = Mean of background

Gehan z Test Value	1.436
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.151

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Sample 1 = Sample 2

P-Value \geq alpha (0.05)

Deep Sediment (2.5'-6')**Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects**

User Selected Options

Date/Time of Computation	ProUCL 5.18/23/2016 4:29:03 PM
From File	PUCL_deep_08232016.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median = Sample 2 Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Sample 1 Mean/Median \neq Sample 2 Mean/Median

Sample 1 Data: Mercury(down)

Sample 2 Data: Mercury(up)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	45	11
Number of Non-Detects	3	0
Number of Detect Data	42	11
Minimum Non-Detect	110	N/A
Maximum Non-Detect	120	N/A
Percent Non-detects	6.67%	0.00%
Minimum Detect	120	12.3
Maximum Detect	22600	9570
Mean of Detects	8229	2181
Median of Detects	6870	425
SD of Detects	5786	3289
KM Mean	7688	2181
KM SD	5883	3289

Sample 1 vs Sample 2 Gehan Test

H0: Mean of Sample 1 = Mean of background

Gehan z Test Value	3.147
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96E+00
P-Value	0.00165

Conclusion with Alpha = 0.05

Reject H0, Conclude Sample 1 \neq Sample 2

P-Value < alpha (0.05)